Aligned Elements User Manual

V2.3.2.10145

List of Content

6. Tool Administration 119

1. Introduction

1.1. Introduction

Aligned Elements is a Design History File Management Solution to help you create and maintain your Design History File documentation.

Aligned Elements is created to support the documentation standards for highly regulated markets. This solution includes a number of different modules used for all parts of the DHF Management, all merged into one:

- Requirement management, structure your project documentation to make the right decisions and the right next steps.
- Document management, help you keep your document versioned and under control and features a tight integration with Microsoft Word automating some documentation tasks.
- Version manager, automatically keep an audit trail of all your changes in your project. Identify the status at different milestones.
- Issue management, report all your know errors or to-dos and link to your existing documentation.

It also supports an instant gap analysis where you continuously can verify what inconsistencies you have in your project (before someone else does).

1.2. Reading Guide

The user manual is structured into the following parts:

- The first part is the description of all different screens and their functions. This part is used to get an overview of the available features and functions.
- The second part is structured around daily tasks and is supposed to answer the question *How to…* do the specific task.
- The third part describes the Microsoft Word Integration in detail.
- The fourth part describes common trouble-shooting tasks.
- The last part describes assorted administrator tasks and is only intended for advanced users with the needs to configure a project, its users and to take care of maintenance issues.

1.3. References

References Description

No 1. SQL Server 2005 Books online (November 2008):
http://www.microsoft.com/downloads/details.aspx?FamilyID=be6a2c5d-00df-4220-b133-29c1e0b6585f&DisplayLang=en

No 2. SQL Server 2008 Books online (October 2009):
http://www.microsoft.com/downloads/details.aspx?familyid=765433F7-0983-4D7A-B628-0A98145BCB97&displaylang=en

No 3. SQL Server 2012 Books online:
http://msdn.microsoft.com/en-us/library/ms130214.aspx

No 4. SQL Server 2014 Books online
http://technet.microsoft.com/en-us/library/ms130214.aspx

1.4. Conventions used in this manual

To make reading easier, the names of dialogs, menus, menu items, labels etc. are written in italic bold e.g. ***Project View***.

A menu choice can at times be indicated with an arrow ***Project View -> Exit***.

User interface buttons are indicated by the use of tags e.g. **< *OK* >** in italic bold.

File and directory paths are written in italic e.g. ***serverName/server***

1.5. Disclaimer

This user manual is solely intended for user guidance and does not imply any legally binding description of functionality.

Since Aligned Elements does not prescribe any specific process, the scope of the manual excludes any development process related issues. This is expected to be provided from the customer's own organization.

2. General Overview

2.1. Basic Concepts

Aligned Elements is a Design History File Management solution that captures and manages the documentation parts in your project that are intended to be under design control.

The fundamental building blocks of Aligned Elements are the so called ***Document objects***. A Document Object is a requirement, a specification, a use case etc.

The document object types are defined in xml templates and therefore customizable. These xml files are called ***Document Object Templates*** and contain among other things the attributes that make up a certain ***Document Object Type*** (such as requirements, specifications etc.). A Document Object contains a set of attributes e.g. a requirement would have a title, a priority and a description.

Each Document Object Template this defines a Document Object Type. The default installation of Aligned Elements provides the following document object types:

Requirement	Failure Mode	Issue
Specification	Hazard	Attachment
Use Case	Mitigation	File
Test Case	Review	Executed Test Case
DHFLineItem	WizardReport	Signature

You can modify the existing document object templates or create new templates in order to accommodate to your local quality and development process.

The data belonging to a Document Object is under strict version control. All committed changes made to a document object create a new revision of the object. Consequently, each document object has a so called revision number indicating how many times it has been altered. Old revisions of a document object cannot be altered.

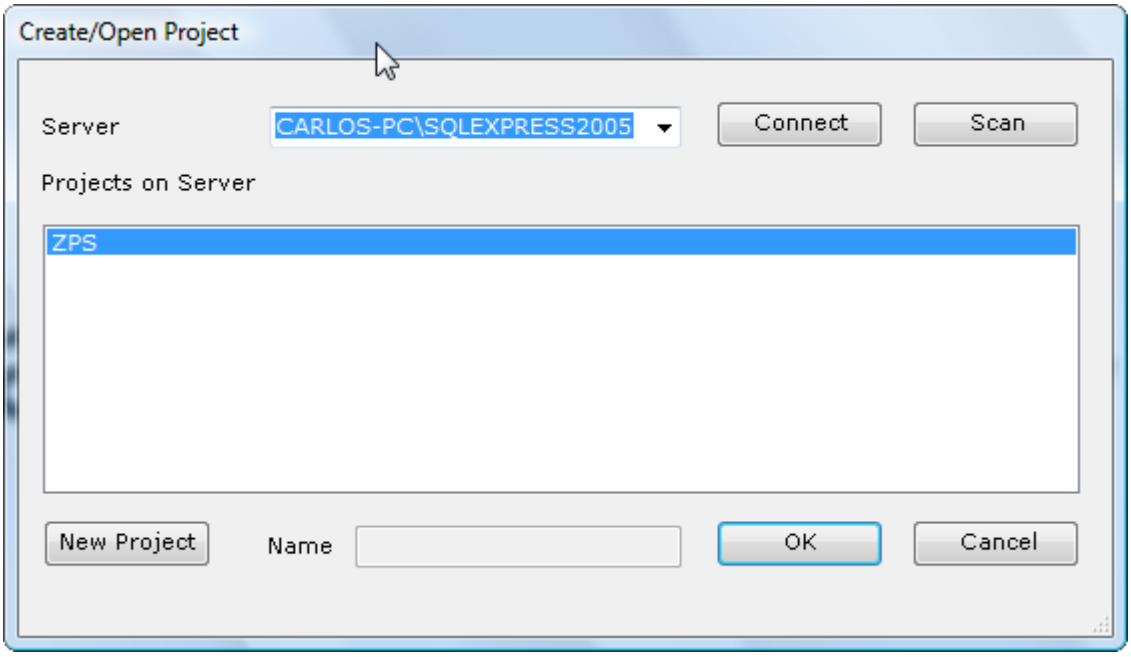
Document Objects can be linked to each other via so called traces. A trace is a one-way relation between two document objects with a defined direction e.g. a trace from a requirement to a specification indicates that the requirement has been fulfilled by the specification.

In Aligned Elements, you can trace any document object to any other document object.

Aligned Elements is a client/server system allowing multiple clients to work on the same project simultaneously, provided that they have access to the central server.

2.2. Open Project

When Aligned Elements is started you are instructed to select a project on the selected server to log in to:



The ***Server*** is a database server running on a PC somewhere on your local network. Aligned Elements can ***scan*** for available databases by clicking the ***<Scan >*** button.

To connect to a server and display the available Projects, click ***<Connect >***. To open a Project, select it in the list and click ***<OK >*** or double click on the Project Item.

Note! Beware that scanning for databases may be blocked by the local firewall settings.

If you know that a database exists, you can manually type in the name on the form ***ServerName\SQLEXPRESS*** where ***"SQLEXPRESS"*** is the name of the database instance. The name can be different depending on your database setup.

Note! The path to the Server name uses backslashes!

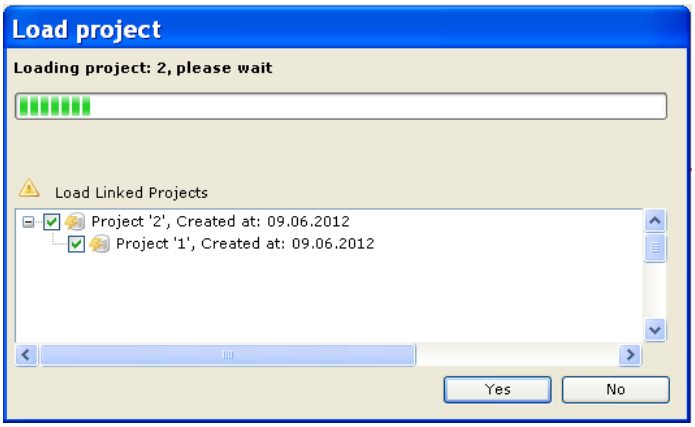
You can also create a new project by clicking the ***< New Project >*** button and entering a unique project name in the ***Name*** field. The project will be created on the defined server.

Clicking ***< OK >*** will load the project and proceed to the login dialog.

The last 25 successfully loaded projects are stored in the ***File -> Recent Project*** menu for fast access.

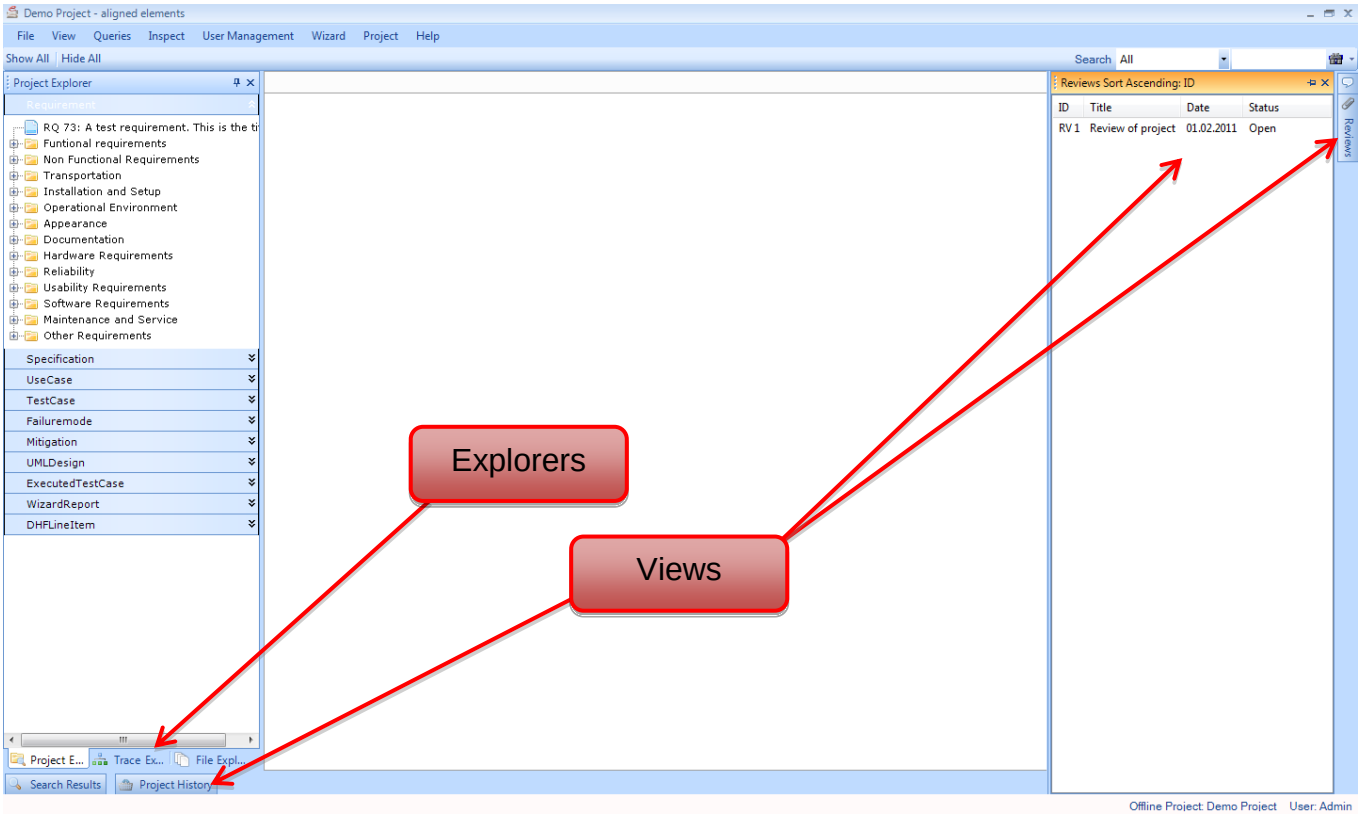
2.2.1. Loading linked projects

If the current project is linked to dependent project a.k.a linked projects (see Work with Linked Projects3.26), there emerges a possibility to load a selected subset of these linked project. Linked projects can also be dynamically opened later on using the Project Hierarchy (see Work with Linked Projects)



2.3. Main Screen

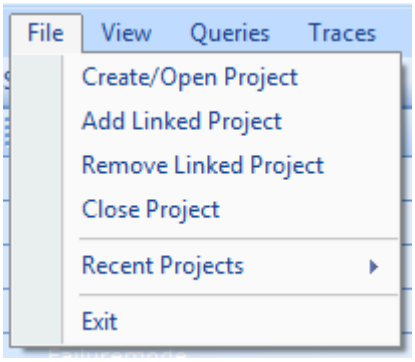
When the project is loaded, you will be presented with the main screen:



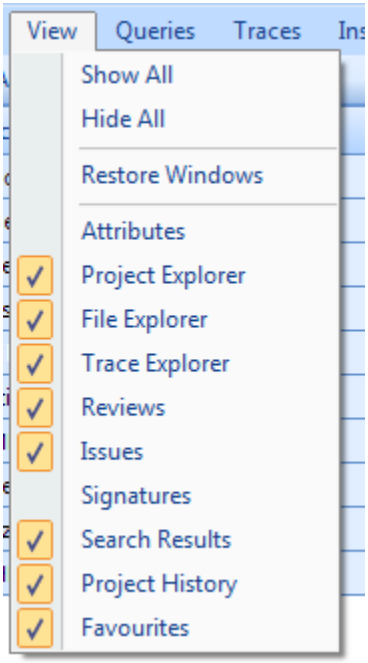
Aligned Elements consist of a few different dialogs and windows as displayed above. These are all explained in detail in the sections below. If any of the windows disappear, you can display all of them again by pressing ***View -> Show All*** in the menu tool bar.

2.4. Menus

The ***File*** menu allows you to open a different project or to link to an external project. You may also exit the application from here.

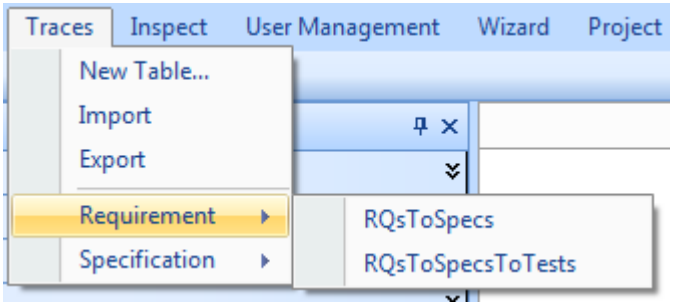


The ***View*** menu displays all available views in Aligned Elements. Here the views can be displayed or hidden by toggling the check mark for each entry.
You can also toggle to views belonging to linked projects or snapshots that you have displayed.

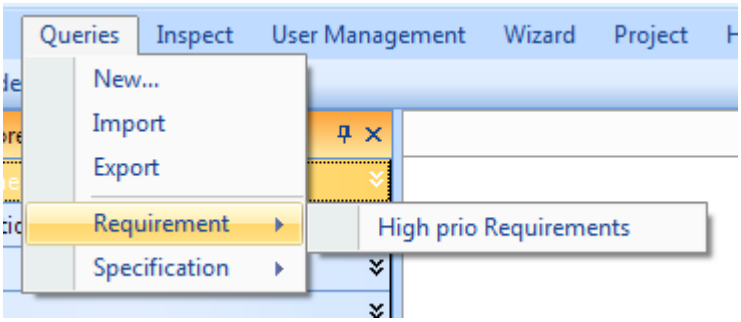


Use the ***Restore Windows*** option to revert to the default window configuration.

Create and Run Trace Tables, using the ***Traces*** option, more information in the section 3.7



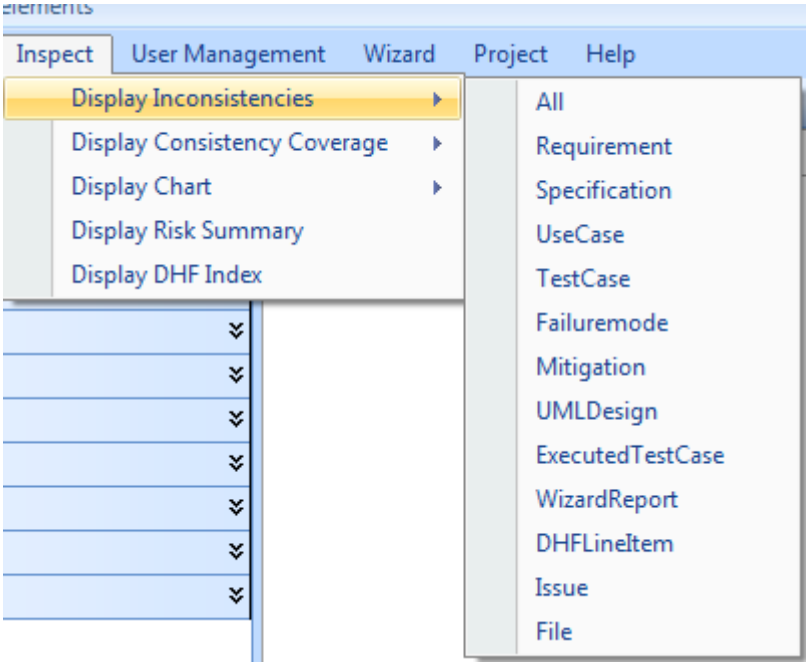
Use the ***Queries*** option to access existing queries or add new queries, more information in the section 3.6



Existing queries are grouped according to Document Object Type Name. Use the ***Import*** and ***Export*** menu items to export and import Queries to/from xml.

Note! When exporting a query, the exported file does not contain any references to the items in the Input set. The input set is always empty in the exported file.

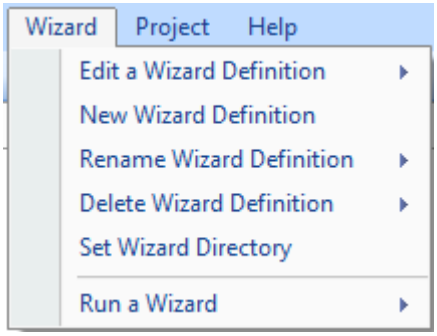
The ***Inspect*** menu item contains functions for analyzing the Project content.



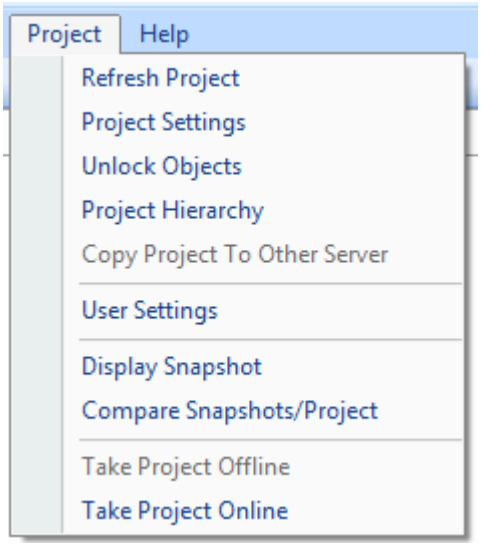
Display inconsistencies is described in section 3.17, ***Consistency Coverage*** is described in 3.18, ***Chart*** handling is covered in 3.19.
For information on ***Display the DHF Index***, see 3.20, or ***Display a Risk Summary***, see 3.21.

The ***User Management*** menu allows managing your users and user groups, more info in the section 6.1.

The ***Wizard*** menu allows creating and running regulatory wizards. Before this feature can be used, you must define a wizard directory where defined wizards are stored, more info in the section 3.27.



The ***Project Menu*** contains a number of project wide functions.



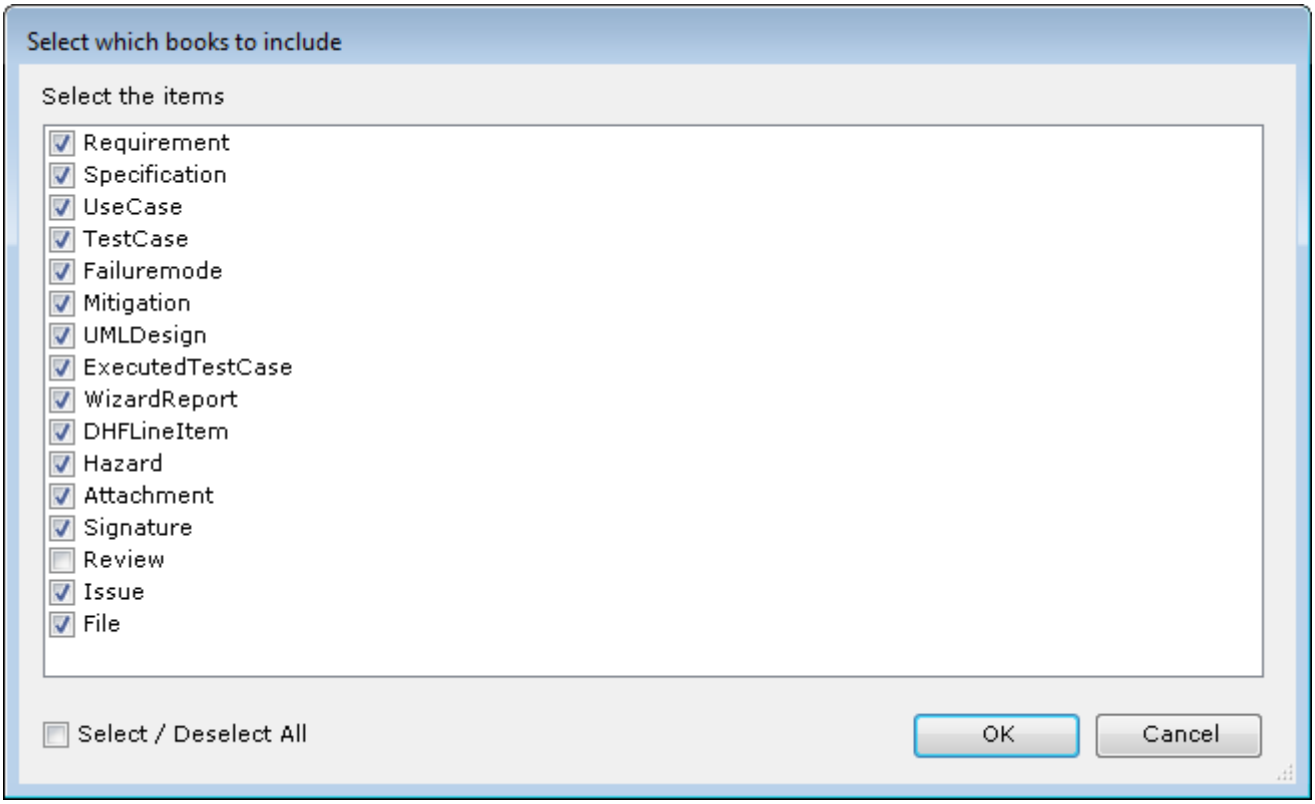
The ***Project Menu*** has a ***Refresh Project*** function for forcing a refresh of the complete project. This is used to get the most up to date information about any inconsistencies and trace-relationship.

There is also access to the ***Project settings*** and ***User Settings***, which are described in detail in section 6.4 and 6.5 and the possibility to ***Unlock Objects***, explained in 6.6.

The ***Project Hierarchy*** is explained in section 3.26.

You can copy the current content of a Project to a different server using the ***Copy Project to Other Server*** option. As a part of this function you can also rename the (new) project.

When copying a project you have option to select which Document object types to include in the operation:



Note!

- *When copying a project to a different server, only the current revisions of the objects are copied, not the old revisions and none of the project history is copied.*

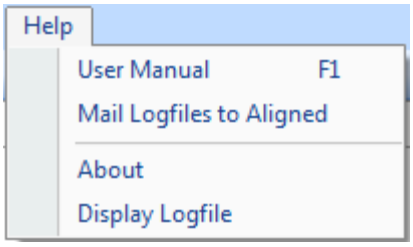
- *Furthermore, if the project is renamed, all Word Files containing Document Objects become invalid and cannot be synchronized (since the original project name is a part of the identifier of the object in the Word File). As a consequence, in order to make the objects synchronizable, all Document Objects needs to be taken deleted from the Word File and inserted again.*

In this menu you may ***Display Snapshots*** and ***Compare Snapshots*** from this menu. A snapshot can be compared with other snapshots or with the project itself in its current state.

Displaying currently logged in users makes it possible to see who is currently working in the project. Note that only users logged into the master project, not in linked projects, are displayed.

Taking a project Offline (and back Online) is described 3.28.

The ***Help*** menu provides a link to the User Manual and lets you to display an about box with the current version number or to send log-files to Aligned AG for support (see 5.4).

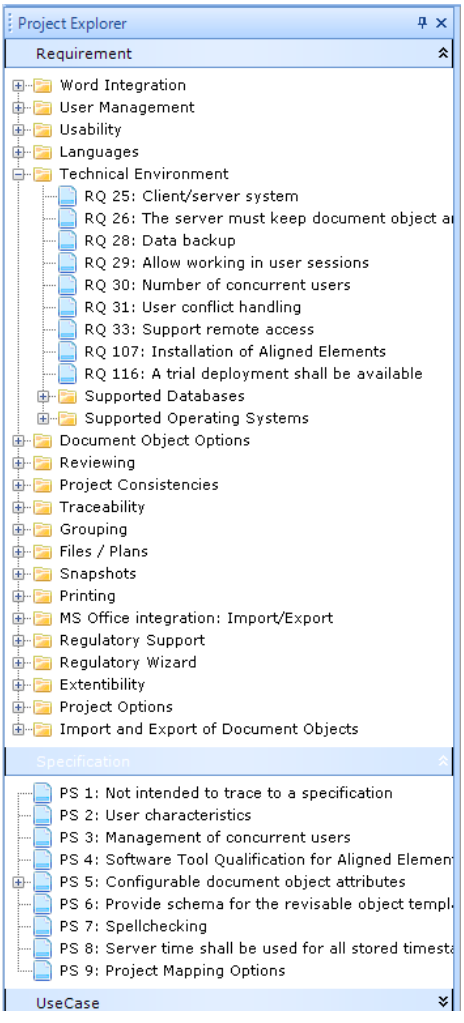


If no email properties are configured for the current user, the log files will be zipped and placed on the desktop, available for manual emailing to support@aligned.ch.

Click on the ***About*** entry obtain the current release version of your installed Aligned Elements version. Click the ***Display Logfile*** entry to open the current log file for diagnostic purposes.

2.5. Explorers

2.5.1. Project Explorer



The ***Project Explorer*** gives an overview of the document objects available in your Aligned Elements project.

The content of the ***Project Explorer*** is loaded on-demand when the user clicks to expand a Document Object Type ribbon.

You can create and rename chapters (use the context menu through right-click on an item with the mouse) to structure the document objects as you please.

Double-clicking on a document object will display it in full details (see 2.6).

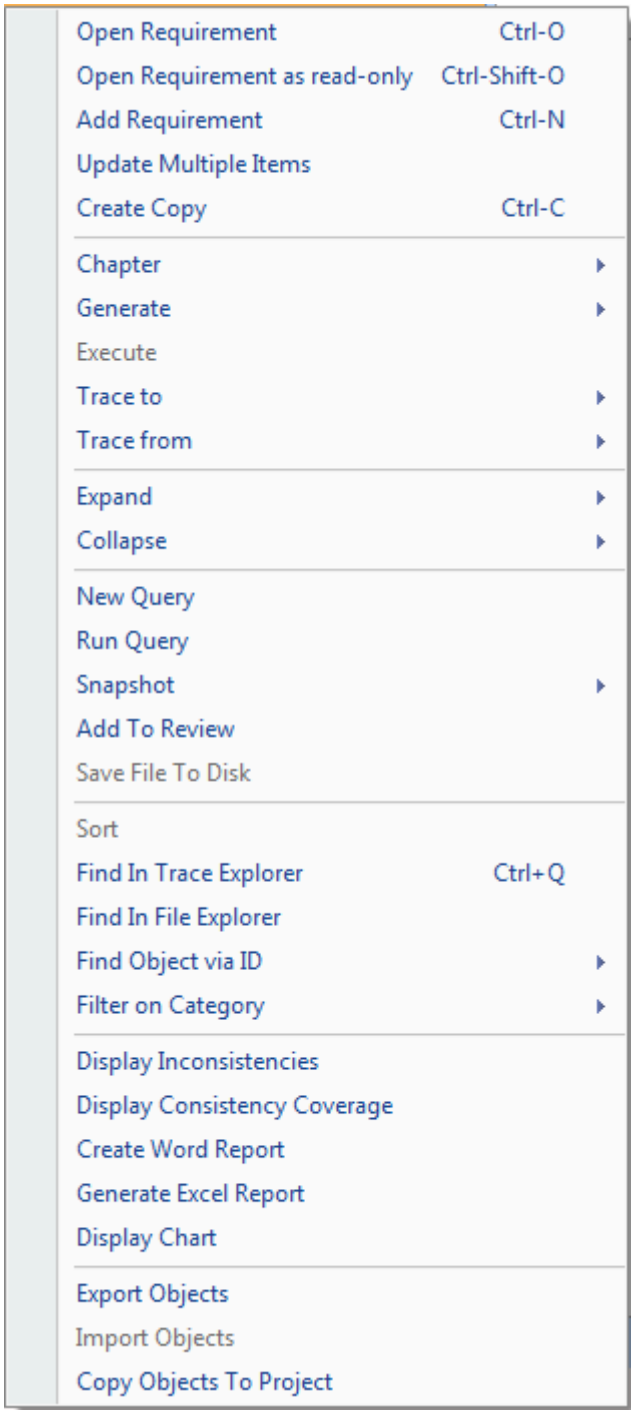
You can also ***move*** document objects into chapters or reorder chapters using drag and drop.

Document objects belong in their respective type section. You cannot place e.g. a requirement into the folder for specifications.

The listed order of a document object, chapters and type sections can also be altered through drag and drop. To change the display order, drag the object to the left until the

icon turns to a double pointed arrow (←→) and drop it on another object. When an object is dragged and dropped on an object below its original position, it is placed below the drop-target. If dropped on an object above its original position, it is placed above the drop-target.

The ***Project Explorer*** context menu contains a number of useful functions.



- **Open <document object type>**
  Select this menu item to display the document object in a ***Document Object Form***. This is equivalent to double-clicking on a document object.

- **Open <document object type> as read-only**
  Select this menu item to display the document object in a ***Document Object Form*** as read-only. In this case the object is not locked for editing and can be modified by other users. This is equivalent to Shift-double-clicking on a document object.

- **Add <document object type >**
  Select this menu item to display a new document object in a ***Document Object Form***. The new document object is not saved/committed until you have clicked ***<OK>*** in the ***Document Object Form***.

- **Update Multiple Items**
  Select this menu item to update an attribute value for the selected document objects of the same time i.e. a batch update.

- **Create Copy (of a <document object type >)**
  Select this menu item to create a new document object with the attribute values copied from the original document object.

  Note! Traces are copied optionally when you select this option (both incoming, outgoing, issues and attachments). An exception is made for Failure-mode like Document Objects, where all traced Hazard Document Objects (outgoing) are always copied and any traces towards existing Mitigation Document Objects are automatically set for the copy.

- **Chapter**
  Select this menu option to create, rename or remove chapters. For information on how to copy chapter structures resp. exporting and importing chapter structures, see 3.3.

Note! Only empty chapters or chapters that contain empty chapters can be removed.

- **Generate**
  Select this menu option to generate a new document object of another type based on input information of the selected document object. Using this option will automatically create a trace between the parent object and the generated object, see 3.4.

- **Execute**
  This option is only available for Test Cases and creates an Executed Test Case document object based on data from Test Case, see 3.11.

- **Trace To / Trace From**
  Select this menu item to set or remove traces to/from this document object to/from other document objects, see 3.4.

- **Expand / Collapse**
  Expand or collapses the selected chapters (nodes) or all chapters (nodes).

- **New Query**
  Use this menu item to create a new static query with the selected items as input objects.

- **Run Query**
  Use this menu item to run an existing query on the selected document objects. This will create a copy of the selected query with the selected items as input objects.

  Note that the copied query (created when using Run Query) is always a static (input set) query, regardless of the input set type of the original query.

- **Snapshot**
  Select this menu option to add a snapshot to the project or part of the project (see 3.15 for details).

- **Add to Review**
  Select this menu option to automatically add a number of Document Objects to a new or an existing Review. See more at 0.

- **Save File To Disk**
  Use this menu option to save Files in File Attributes in e.g. Attachments to disk with a single click.

- **Sort**
  Select this option to automatically sort the document objects in a chapter based on ID.

- **Find In Trace Explorer**
  Select a Document Object and click this menu item to have it selected in the ***Trace Explorer*** (provided that the Document Object has any incoming or outgoing traces).

- **Find In File Explorer**

Select a Document Object and click this menu item to locate the ***File Objects*** in the ***File Explorer*** that contains the object (provided that the Document Object has been placed in any Word File).

- **Find Object via ID**
  Use the option to find a particular document object in the ***Project Explorer*** by typing an ID in the search field. This field can also be used for free text search in the object titles.

- **Filter on Category**
  Hides/unhides document object books/types according to their Category in the ***Project Explorer***. This is helpful when a large number of templates are used in the Project. When the filter is applied, the ***Project Explorer*** caption indicates it with a **[filtered]** text. User defined Categories can be set in the Document Object Templates. For the default templates, the following Categories are applied:

Document Object Type	Category
Requirement	Design Input
Specification	Design Output
Use Case	Design Output
Test Case	VnV
Executed Test Case	VnV
Failure Mode	Risk Management
Hazard	Risk Management
Mitigation	Risk Management
WizardReport	Project Management
DHFLineItem	Project Management

- **Display Inconsistencies**
  Display all inconsistencies for a chapter or for individual document objects. See 3.17 for details.

- **Display Consistency Coverage**
  Display a consistency coverage report for the selected objects. See more about Consistency Coverage in 3.18.

- **Create Word Report**
  Use this option to create an MS Word report containing the objects with all attributes in the selected set.

- **Generate Excel Report**
  Select this option to export the selected objects to Excel (one attribute per column).

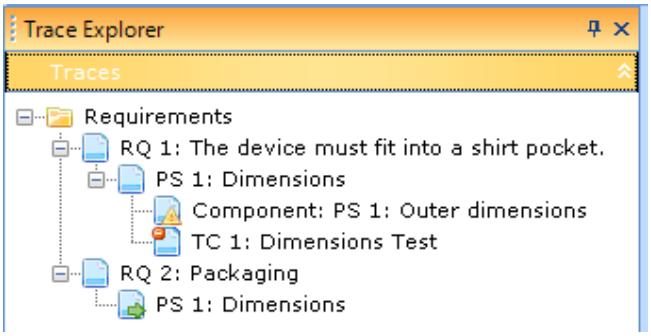
Note! Table Attributes are not exported. All attribute values are exported as plain text.

- **Display Chart**
  Displays a breakdown chart for the selected objects. More information about Charts in 3.19.

- **Export, Import and Copy Document Objects to other Projects**
  Use these options to Export Document Objects to XML files. These objects can later be imported in other projects. A second alternative is to copy the objects to a different project using an automation of Export and Import. More information in 3.23, 3.24 and 3.25.

2.5.2. Trace Explorer

The ***Trace Explorer*** is divided in two sections.
The top section ***Traces*** displays a tree for all traced objects in the project (as well as to external projects if you have linked your project to external projects).



Each root node in the project represents the document objects of that type that have no incoming traces. Thus, the node “Use Cases” contains use cases which have no incoming trace from e.g. a requirement. The use cases that DO have incoming traces from requirements can be found as child nodes to the requirement section.

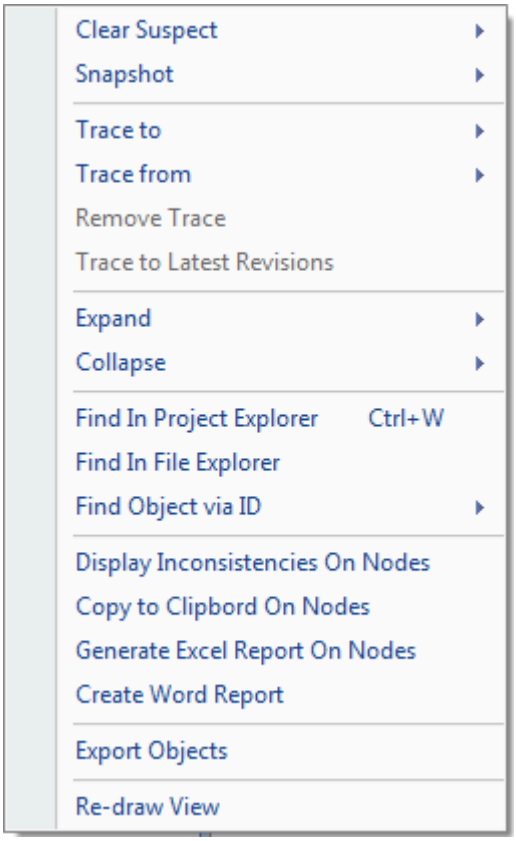
If a document object appears multiple times in the trace tree the full sub-tree is only displayed once and for all other occurrences a reference node is displayed as  . On double-clicking the node, you will navigate to the real node which contains the full sub-tree.

If a trace is set to suspect status (occurs when the parent object has been changed after it was traced to a child object), the parent object is displayed with the  - symbol.

Traces to document objects that are not of the last existing revision (only applies to traces between document objects in different projects) are displayed as:  .

To display a document object, double click on its entry in the ***Trace Explorer***.

The ***Traces*** context menu contains the following functions:



- **Clear Suspect**
  Use this option to clear suspect traces either on the selected objects or on all objects in the trace tree. Read more about suspect traces in 0.

- **Snapshot**
  Select this option to create a snapshot on the selected document objects.

- **Trace To/Trace From**
  Set and remove traces to and from document objects, see 3.4.

- **Remove Trace**
  Select this option to remove the trace from the parent object(s) to the selected object(s).

- **Trace to the Latest Revisions**
  Traces across project boundaries are not automatically updated to point at the latest revision of a document object. This function allows you to manually ensure that the last existing revision of a document object is traced (see 3.26).

- **Expand / Collapse**
  Expands or collapses the nodes in the tree in different ways.

- **Find In File Explorer**
  Select a Document Object and click this menu item to locate the ***File Objects*** in the ***File Explorer*** that contains the object (provided that the Document Object has been placed in any Word File).

- **Find Object via ID**
  Use the option to find a particular document object in the ***Trace Tree*** by typing an ID in the search field. This field can also be used for free text search in the object titles.

- **Display Inconsistencies on Nodes**
  Display all inconsistencies for the selected nodes and their sub nodes.

- **Copy to Clipboard on Nodes**
  Copies the trace branches of all selected nodes into semi-colon separated text lines into the Clipboard. When using this function you will be prompted to select which Document object types to include in the traces.

- **Generate Excel Reports on Nodes**
  Generates an excel report of the trace branches of all selected. When using this function you will be prompted to select which Document object types to include in the traces.

- **Create Word Report**
  Use this option to create an MS Word report containing the objects with all attributes in the selected set.

- **Export Objects**
  Use this option to export objects. See 3.23.

- **Re-draw View**
  Use this option to force a re-draw of the trace view.

2.5.3. File Explorer

The ***File Explorer*** allows you to manage a special type of document objects, called File Objects. A File Object is like any other document object under version control but also contain a file which is implicitly under version control.

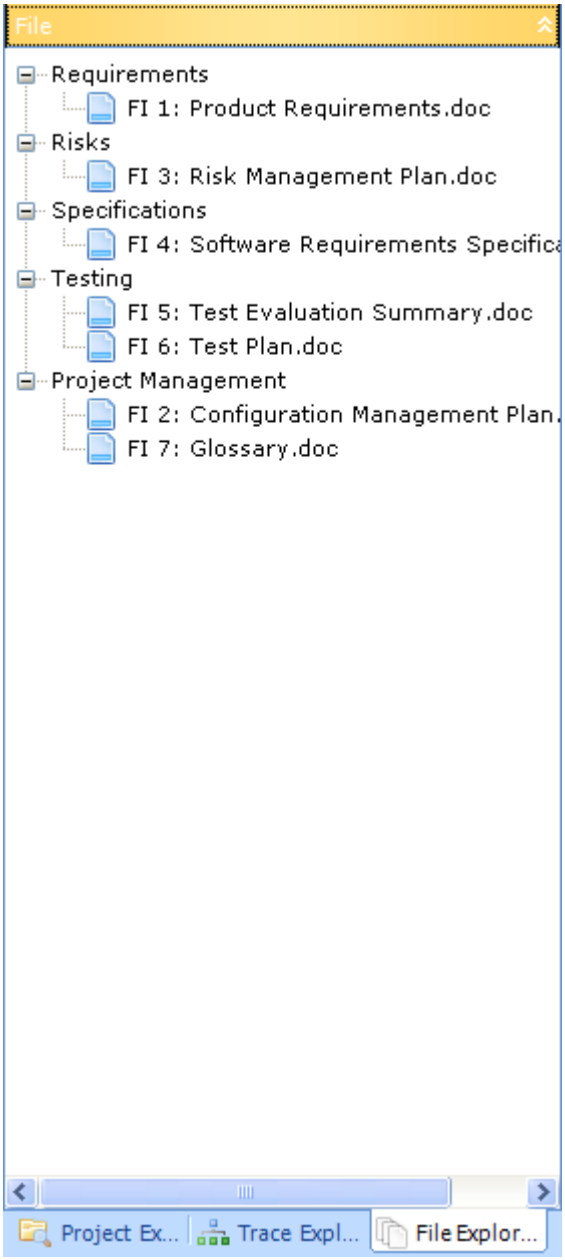
More specifically, if the file in a File Object is a Microsoft Word Document it in turn can contain other document objects.

You can consider File Objects as the Word Document view of your project. Read more in the section 0.

In this explorer the context menu works very similar to the one in the ***Project Explorer***.

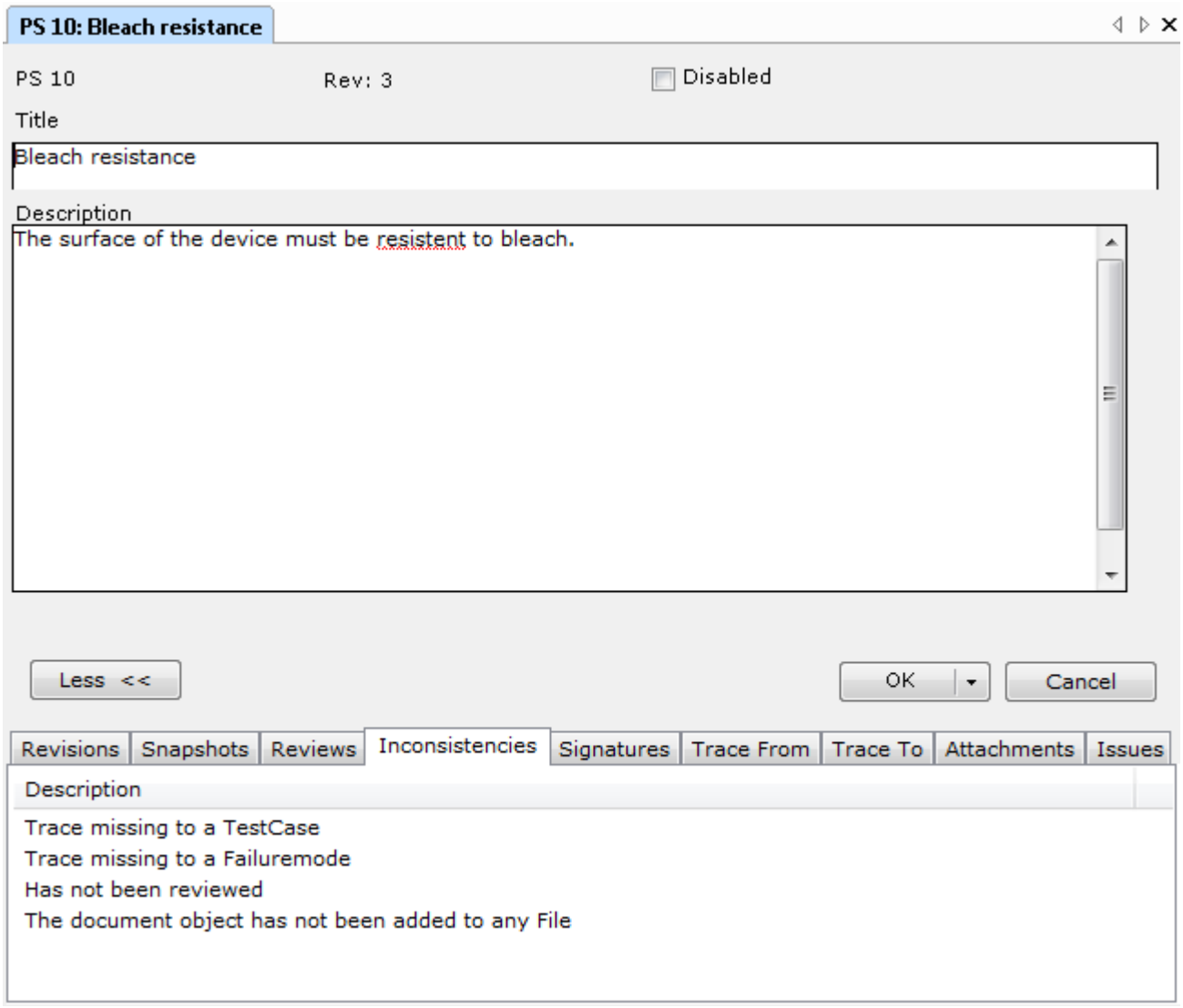
In the context menu, there is the additional possibility to set a snapshot on all objects that are contained in a Word Document.

There is also a possibility to save files straight to disk without having to open the individual Document Objects.



2.6. Document Object Forms

Double clicking on a document (from anywhere) will display the document object in its form:



In the form you can see the current revision and all attributes that belong to the document object (in the example above ***Title, Priority*** and ***Description***).

There exist a number of available attribute types such as String, Rich Text, Table, Date, Enum, bool (Checkbox) etc. For information on how to change the attributes, see 6.7.

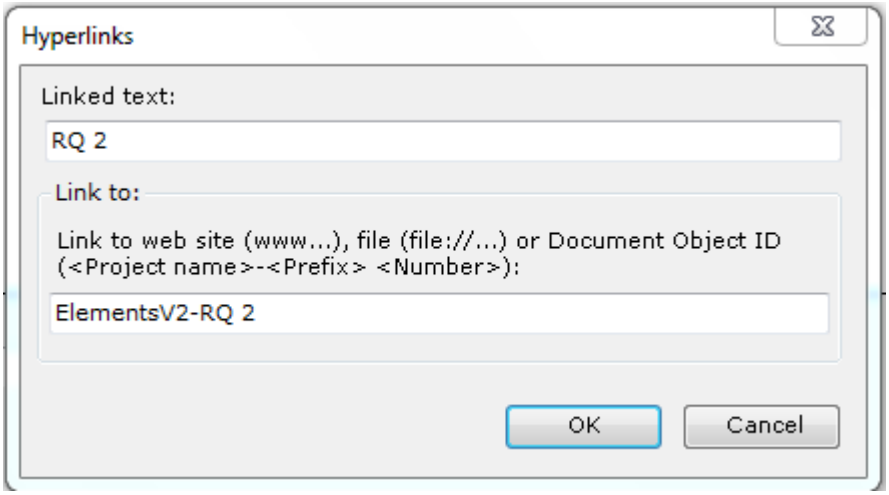
2.6.1. Working with Rich-Text attributes

In the picture above, the Description attribute is an example of the Rich Text attribute. Rich text attributes support any rich content such as Text formatting, hyper-links, images, tables or bullets and lists.

To insert these into please use the context menu you get when you right-click in the text area.

You can also insert special symbols like €,Ω or ∑ by using the <Insert> entry.

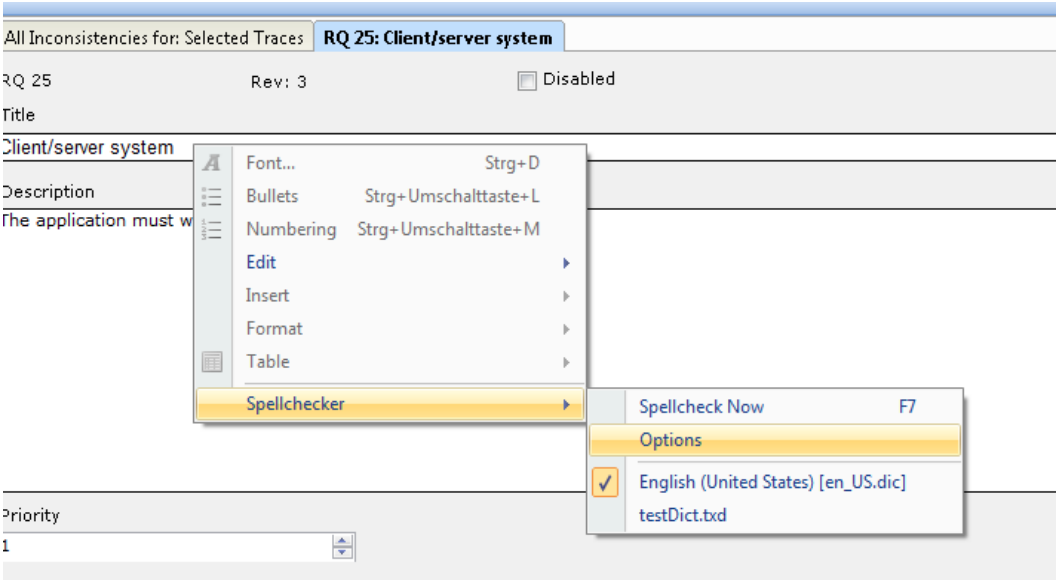
With hyper-links you can also create textual references to existing document objects. In the example below a link will be created to RQ 2 in the project ElementsV2:



Almost all rich text features are also available for the Table Attribute with the only limitation that a cell cannot contain a table.

2.6.2. Spell-checking

In the available text, spell checking ids used. The spellchecker will underline misspelled words, just like you are used to from MS Word. Right click in a text field to get access to the context menu.



The checked Dictionaries are active when spellchecking is performed. You can also add a User Dictionary via the Options entry. For more info see 6.1 Spell-checking Dictionaries.

Aligned Elements includes dictionaries for English, German. As default only the English dictionary is loaded. To activate additional Dictionaries please see 6.1 Spell-checking Dictionaries.

You can also display additional details for the object in the bottom part of the form by toggling the ***< More/Less >*** button. The tab pages at the bottom contains (in order):

- the revision history for the object.
- the snapshots that this document object is contained in.
- the reviews in which the document object has been reviewed (including review state)
- a list of the current inconsistencies of the document object.
- a list of the signatures that have been done for the document object
- a list of document objects tracing to this document object.
- a list of document objects that this document object trace to.
- all attachments that this document object traces to.
- all issues (open as well as closed) that this document object traces to.

Display a previous revision of a document object by clicking on an entry in the revision history list. The revision of the document object will be displayed in a separate document object form in read-only mode.

Display the gap between two revisions by selecting two revisions in the revision list and right-click with the mouse and select ***Show Gap***.

You can load attribute data from previous revisions by selecting a revision, right click with the mouse and select ***Revert to This Revision*** in the context menu. This will copy the attribute data from that revision to your current Document Object Form. This only applies to attribute data, not traces.

Copying Revision information to Clipboard is also supported as well as ability to ***Export*** old Revisions of the Document Objects.

Note! ***The Revert to This Revision*** *does not activate an old revision, only copies the attribute data from that revision to your current Document Object Form.*

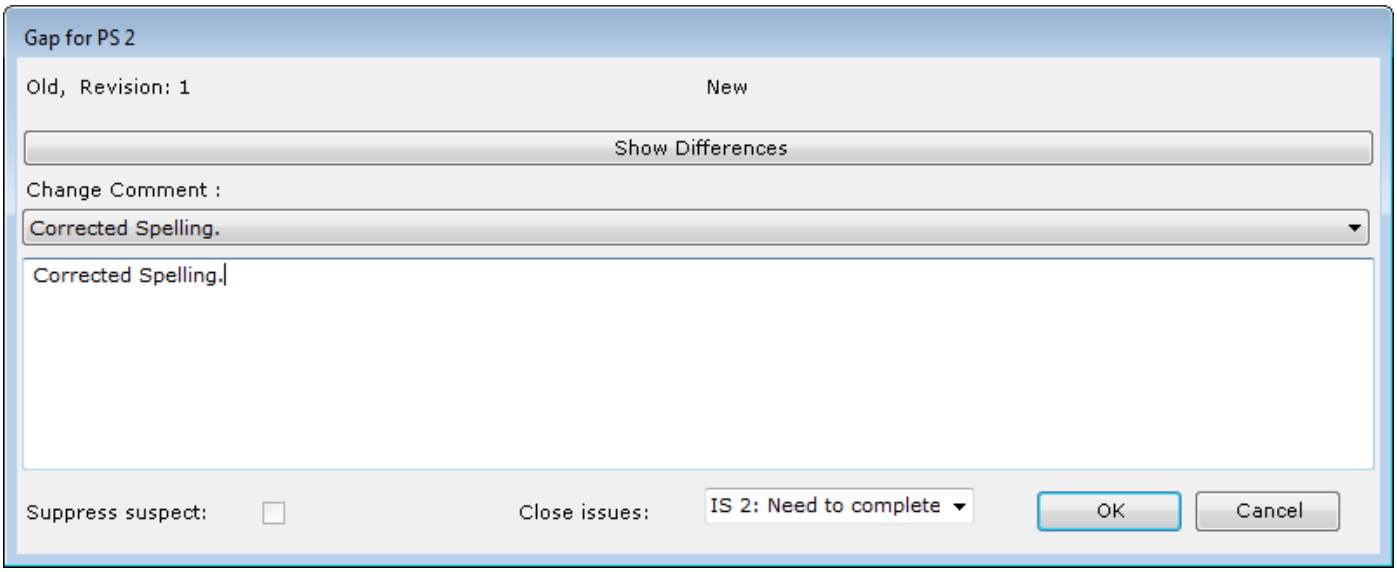
You can also create, display and modify traces to attachments and issues from the detailed view.

You may not delete any document object but you can disable them by checking the ***Disable*** check box and click ***< OK >*** (deleting a document object would make it hard to keep a good project history).

When you have completed your changes in the document object form, you can click ***< OK >*** to commit your changes to the database or ***< Cancel >*** to discard the changes made.

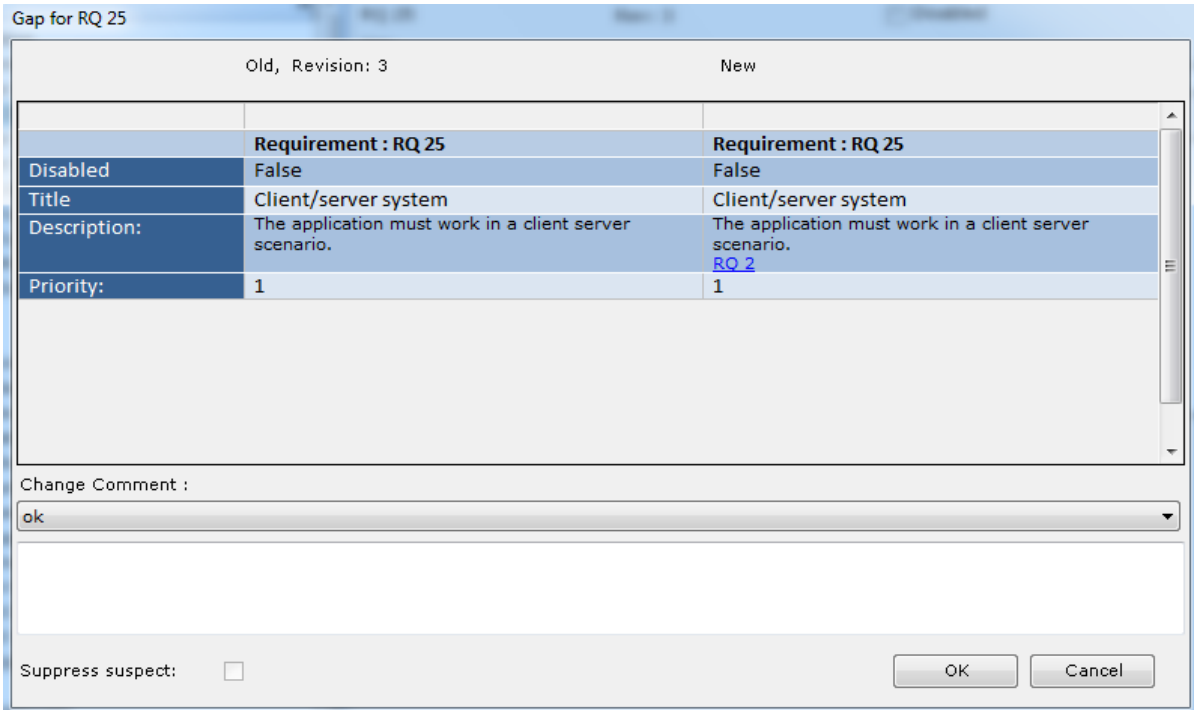
As a part of committing your changes, you will be requested to add a change comment which should state the reason to why the changed were performed.

You can chose to reuse existing change comments, to use standard comments and optionally to not set traces from the Document Object to “suspect” after the commit.
Read more about Gap Dialog options in 3.31.



In this form you can also propagate the change comment to related issues by selecting the relevant traced issues from the drop down form provided that you have clicked ***OK -> Close Issues*** in the Document Object Form. These issues will consequently be closed after the commit.

To compare the current modifications with the previous revision of the document object, click on ***<Show Differences>.***



Note! If several document objects traces to this object, beware of that the Issue is closed for all the related document objects.

To display more than one document object next to each other in the ***Document Object Form***, see 3.30.

If multiple document objects have been changes, you may re-use the change comment for all of them (e.g. when modifying a Failure-mode and underlying Hazards). To do this, check the ***Use comment for all*** check-box (is only displayed when multiple document objects exist).

2.7. Short Cuts in Explorers and Document Object Form

The following short cuts are available:

Project / File Explorer

Enter	Open a Document Object
Ctrl-O	Open a Document Object
Ctrl-Shift-O	Open a Document Object in read-only mode
Ctrl-N	Create new Document Object
Ctrl-Shift-N	Create a new Chapter
Ctrl-C	Copy a Document Object or Chapter structure
Ctrl-V	Paste a Chapter Structure
F2	Change name on Chapter
Delete	Delete empty Chapters
Ctrl-S	Set Snapshot on selected objects
Ctrl-F	Find Object via ID
Ctrl-Q	Find Object in Trace Explorer

Trace Explorer

Ctrl-E	Expand All
Ctrl-S	Set Snapshot on selected objects
Ctrl-F	Find Object via ID
Ctrl-W	Find Object in Project Explorer

Document Object Form

Ctrl-S	Save Document Object
Esc	Cancel Document Object form
Ctrl-Q	Find Object in Trace Explorer
Ctrl-W	Find Object in Project Explorer

Various Views

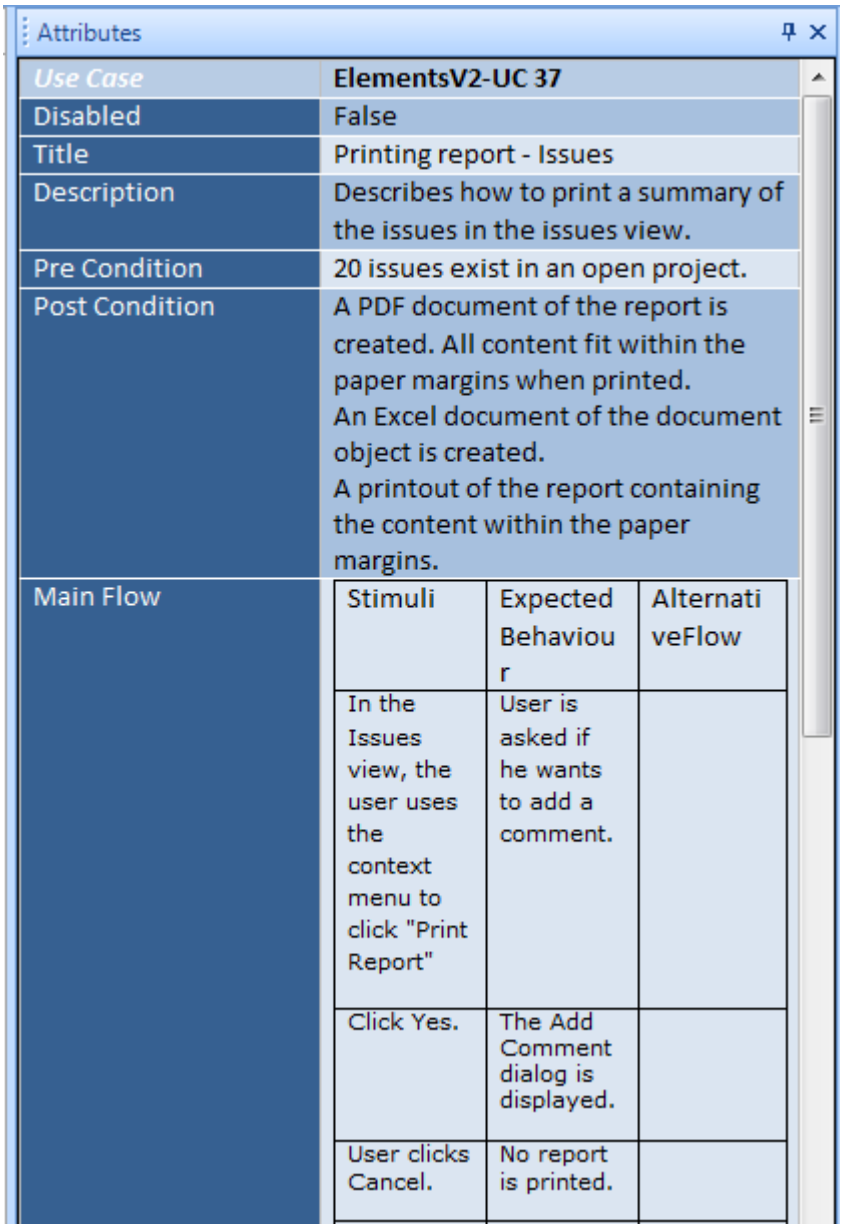
Ctrl-C	Copy to Clipboard
Ctrl-Q	Find Object in Trace Explorer
Ctrl-W	Find Object in Project Explorer

Views

2.7.1. Attributes

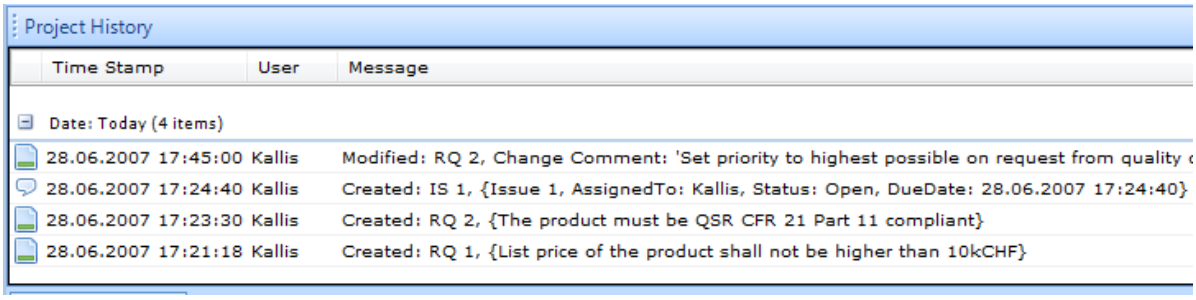
The ***Attribute view*** displays a quick preview for the currently selected document object without having to open it in the document object form.

*Note! Every time an object is selected in a View, the details are displayed in the **Attribute View**. This requires the object to be loaded from the database. If the **Attribute View** is not displayed, the object is not loaded and performance is increased. To increase the performance of Aligned Elements, do not display the **Attribute view** more than necessary.*



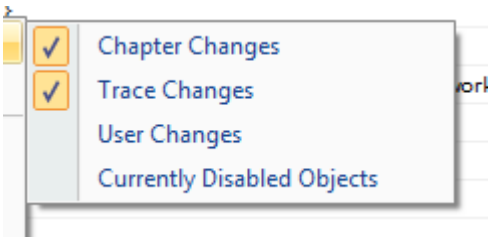
2.7.2. Project History

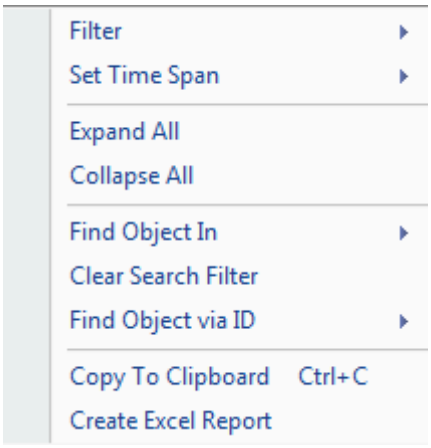
The ***Project History View*** displays all changes that are made in the project.



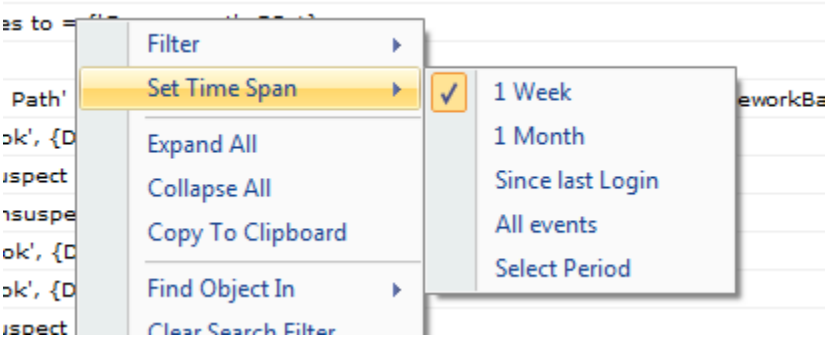
With the use of the context menu (right-click in the view), you get access to the following functions:

With the ***Filter*** option, you can decide which type of Project Events that shall be displayed. Normal modification events (i.e. when a document object is added or modified) are always displayed.



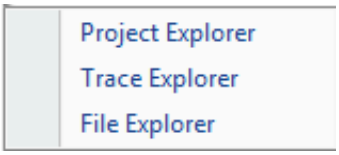


With the ***Set Time Span*** option you can select to display the Project Events for a certain period. Default is set to 1 Week.

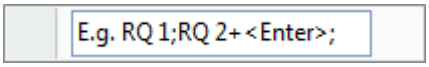


Use can use the ***Expand / Collapse All*** options to expand and collapse subgroups. You can also click on the list headers to sort the Project History according to the column.

Find Object In will select/mark the corresponding Document Object in the ***Project Explorer, Trace Explorer*** or ***File Explorer*** when applicable.



Find Object via ID allows you to filter the content to events that are associated with individual Document Objects. You can search for several IDs simultaneously by entering the IDs separates with semi colons (';') (e.g. TC123; RQ 2; PS 3).



Just like in the other views, this option can optionally be used for finding a particular word in the Project History.

Use the ***Copy To Clipboard*** option to copy the text of the selected events to the Clipboard.

Use the ***Create Excel Report*** option to generate an excel report of the currently selected Project Events.

Tip: To see any changes since your last login, select ***Set Time Span -> Since Last Login*** in the context menu.

2.7.3. Search Results

The ***Search Result View*** displays all results found after using the ***Search Tool*** in the menu toolbar. Here you can search for a text in all document object types as well as within the set of a specific document object type as you select in the drop down menu.

Note! The search applies to String, Rich Text, Table attributes, content of files and Document Object IDs. It is for example not possible to search for an integer (e.g. Priotity or Severity) with this method.

Use (double) quotes to define combined notion i.e. if you look for all document objects containing the word Use Case, then enter "use case" (with quotes) in the search field instead of use case (without quotes) which will look for the occasions of the word 'use' and the word 'case' individually.

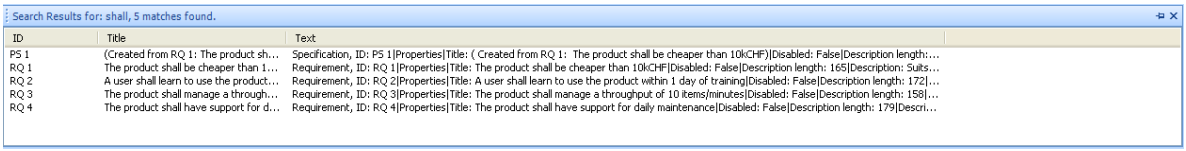
You may also search for document objects based on their IDs, e.g. RQ 4. The result will include document object RQ 4 but also return any textual references.

Note! The search function is case-insensitive but does search for exact matches. Thus, if you enter "empt", it will not find objects containing the word "empty". You can apply the asterisk (*) to search for word stems. In the example above, "empt" would find objects containing the word "empty".*

The default search only retrieves currently enabled document objects but you may also include currently disabled objects using the additional selection arrow next to the binocular icon.

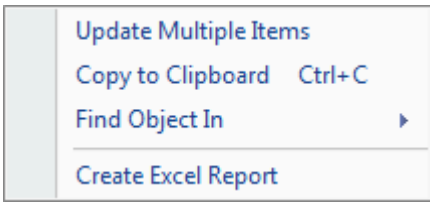
Note! The search function is not case sensitive and searches for any match also within words. Short search expression such as '0', 'a', 'i' or 'or' will not produce any results since these are considered "noise-words" that are ignored when database full-text indexing is used (see 6.9.5).

Double-clinking on an entry will display the ***Document Object*** page.



With the use of the context menu (right-click in the view), you get access to the:

- ***Update Multiple Items*** – works just like in the ***Project Explorer.***
- ***Copy To Clipboard*** – copies the text of the select objects to the clipboard.
- ***Find Object In*** which will select/mark the corresponding Document Object in the ***Project Explorer, Trace Explorer, File Explorer*** when applicable.
- ***Create an Excel Report*** of all selected objects.



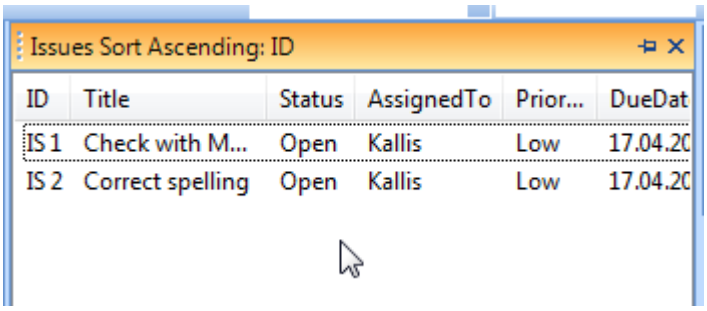
Note! Aligned Elements provides the option to use Sql Server full text search to increase the performance of free text searches, see 6.9.5. When applied the search function also searches the content of attached files of a large number of file types.

The ***Search Result View*** also supports drag functionality for setting traces using drag and drop in the ***Project*** and ***Trace Explorer***.

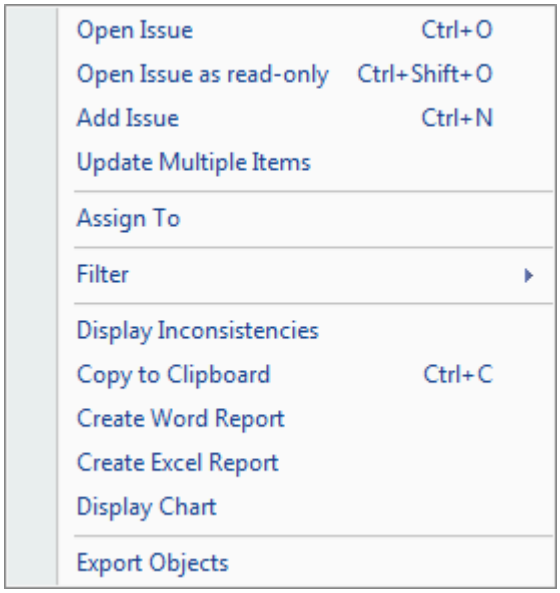
2.7.4. Issues View

The ***Issues View*** displays all issues in the project. Click on the table headers to sort the list according to the values in each column.

Double click on a line to open the corresponding issue in a ***Document Object Form***.



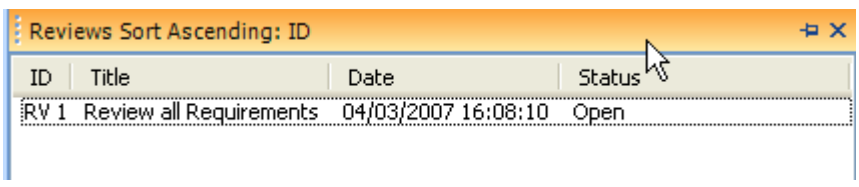
Use the context menu (right-click in the view) to access the following functionality:



- ***Open Issue*** and ***Add Issue***, opens an Issue for editing and creates a new Issue accordingly.
- ***Update Multiple Items*** with attribute changes in batch mode.
- Use the ***Assigned To*** option to assign an issue to a user without opening the Document Object form.
- Use the ***Filter*** settings to display subsets of all issues. The last filter settings are stored.
- ***Display Inconsistencies*** shows a list of all inconsistencies of the selected issues. (or all issues if no issue is selected).
- ***Copy to Clipboard*** copies the selected information to the clipboard.
- ***Create Word Report*** generates a report in word format containing all selected Issues.
- ***Create Excel Report*** generates an Excel file containing the currently selected Issues.
- ***Display Chart*** generates a break down chart of the selected objects.
- ***Export Objects*** exports the selected objects to files. See 3.23.

2.7.5. Reviews View

The ***Reviews View*** displays all reviews in the project. Click on the table headers to sort the list according to the values in each column.



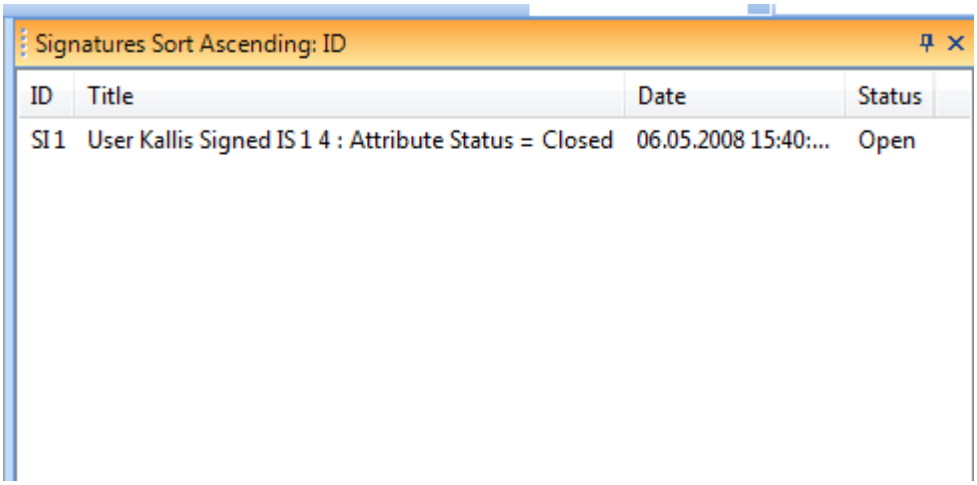
Use the context menu (right-click in the view) to get the same options as in the ***Issue View***.

Double click on a line to open the corresponding review in a ***Document Object Form***.

2.7.6. Signature View

Note! The digital signature functionality is contained in an add-on package and needs to be ordered separately from Aligned AG.

The ***Signature View*** displays all Signatures in the project. Click on the table headers to sort the list according to the values in each column.



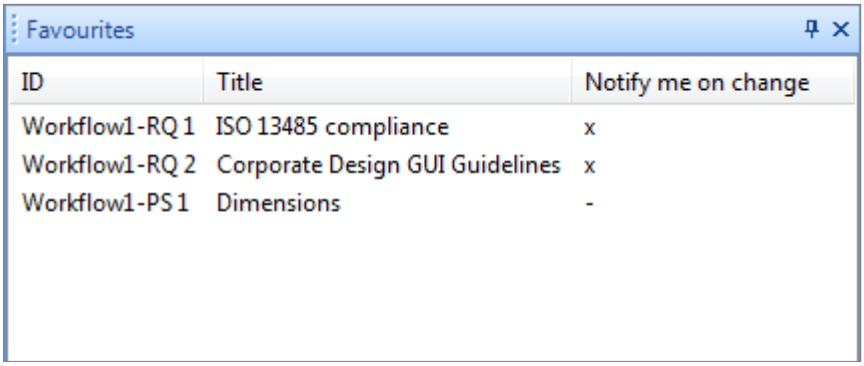
Use the context menu (right-click in the view) to create new Signatures.

You can also use the context menu to set filter options on the ***Signature View*** such as Status and Due Date or to display the inconsistencies for all (select only one signature) or selected (select multiple signatures) signature.

Double click on a line to open the corresponding Signature in a ***Document Object Form***.

2.7.7. Favorites View

The ***Favorites View*** contains Document Objects tagged as favorites by the user. Tagging a Document Object as favorite can be done in the ***Document Object Form*** (by clicking on the Star icon making it yellow) or by dragging and dropping objects into the ***Favorites View***.



The View can contain Document Objects of different types and also Document Objects from linked projects. When a Document Object is modified by anyone, the View is automatically updated to display the most current revision of the Document Object.

By activating the ***Notify me on change*** option for a Document Object, an email will be set to you as soon as the Document Object in question is updated (attributes are changed) containing a description of the changes.

*Note! Notify me on change only works if your User has been set up with an email address in the **User Manager** and if the **Smtp Mail** option has been set up in the **Project Settings**.*

The content of the ***Favorites View*** is personal i.e. connected to the logged in user.

A number of options are available in the ***Favorites View*** context menu, similar to the ones of the ***Issue View*** and/or ***Project View***.

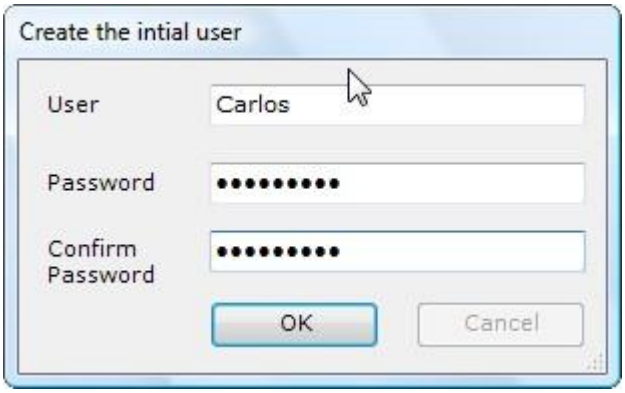
Note! Document Objects of non-current revisions can be added to the Favorites View. However, it is the most current revision of the object that is stored in the database i.e. if the Document object is updated, the Favorites View is refreshed to display the most current revision. Likewise, if the project is closed and reopened, it is the most current revision of the object that is displayed.

3. How to…

3.1. Create a Project

Select ***Open/Create Project*** from the ***File*** menu option (or just start Aligned Elements). Click on the ***<New Project >*** button and type a new and unique name for the project in the name field. You are then prompted browse to the location of your document object templates. Do so by browsing via your network locations to the document object template share to ensure that other users also can reach the same location from their PC:s (If you want to adapt any templates, please read the section 6.7.)

Thereafter you are asked to create the Initial User (see 3.2 for password standards):

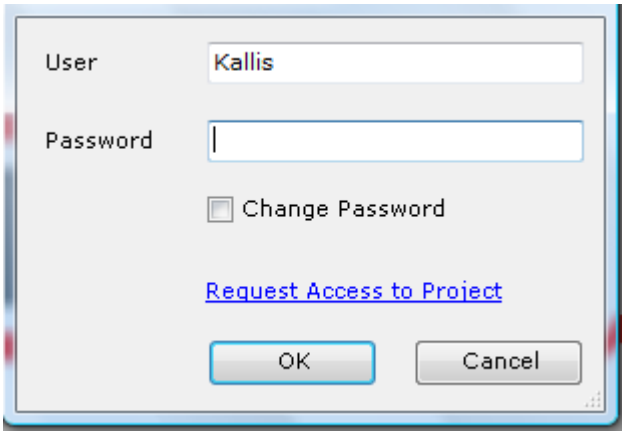


Please keep your Initial user credentials in a safe place. This is the original administrator for the project.

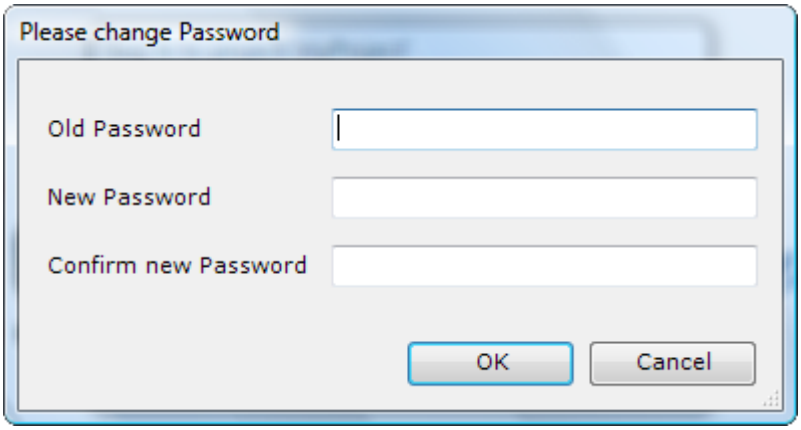
An empty project is loaded and you can start managing your project (e.g. create additional users) and enter data.

3.2. Change Your Password

When opening a project you are prompted with the following login dialog.



To change your password, check the ***Change Password*** check-box and log in as normal. You will then be presented with an additional dialog where you can add your new password:



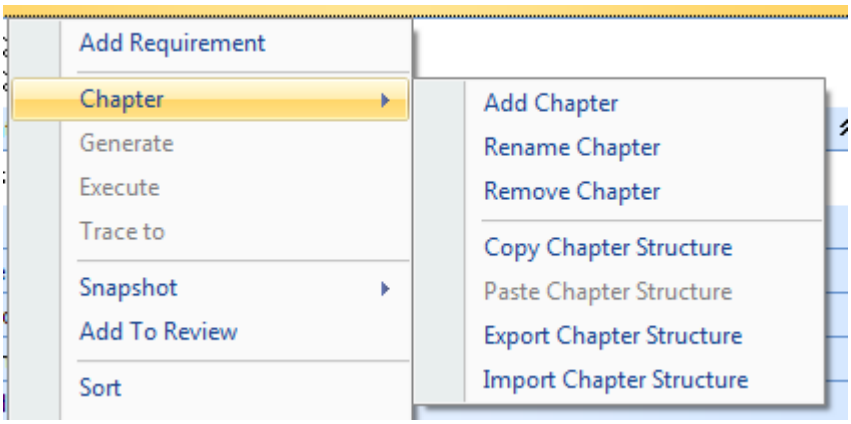
A password needs to be at least 6 characters long and should contain a combination of upper and lower characters, numbers and special characters to be approved as safe. The following characters are allowed in your password, a-z (upper and lower case), 0-9 and the special characters: , ; . : - _ < > = % & * + " & / \ ( ) = ? ' and space.

If you have forgotten your password, ask your administrator to reset it for you.

Note! If you are working with linked projects, it can sometimes be convenient to change the password for your user(s) in all linked projects at the same time. If projects are linked to your current project and you change your password, you will be asked if you want to update the password in all linked projects for your user. If you click ***<Yes >,*** *please note that you have to load the linked projects in order to for the password to change.*

3.3. Work with Chapters

Use the context menu in the Project Explorer to access the operations available for chapters.



You can move chapters to other chapters using Drag and Drop.

- Use ***Add Chapter*** to add a chapter to the root chapter (the ribbon with the Document Object Type Name e.g. “Requirement”) or to another chapter. A chapter name does not have to be unique.
- Use the option ***Rename Chapter*** to change the name of the chapter.
- Use the option ***Remove Chapter*** to remove the chapter.

Note! The chapter (or the corresponding sub chapters) cannot be removed if it/they contain one or more Document Objects.

If several of your books contain the same chapter structure, you can ***Copy*** a ***Chapter Structure*** and ***Paste*** it into the books.

If you want to use a chapter structure in a different project, ***Export*** the ***Chapter Structure*** to a file, and ***Import*** it in the target project.

3.4. Create and removing Traces between Document Objects

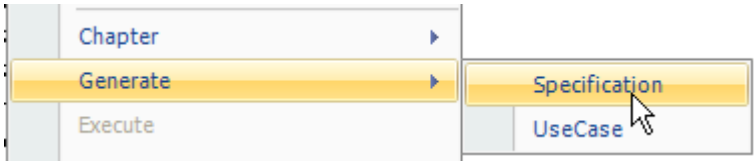
There are a number of ways of creating traces between document objects. However, not all ways are applicable for creating traces between projects. Traces can be set to and from master and linked projects in all explorers, but traces cannot be set from linked projects in the detail view.

Note! The revisions of the document objects involved in a trace operation are NOT incremented.

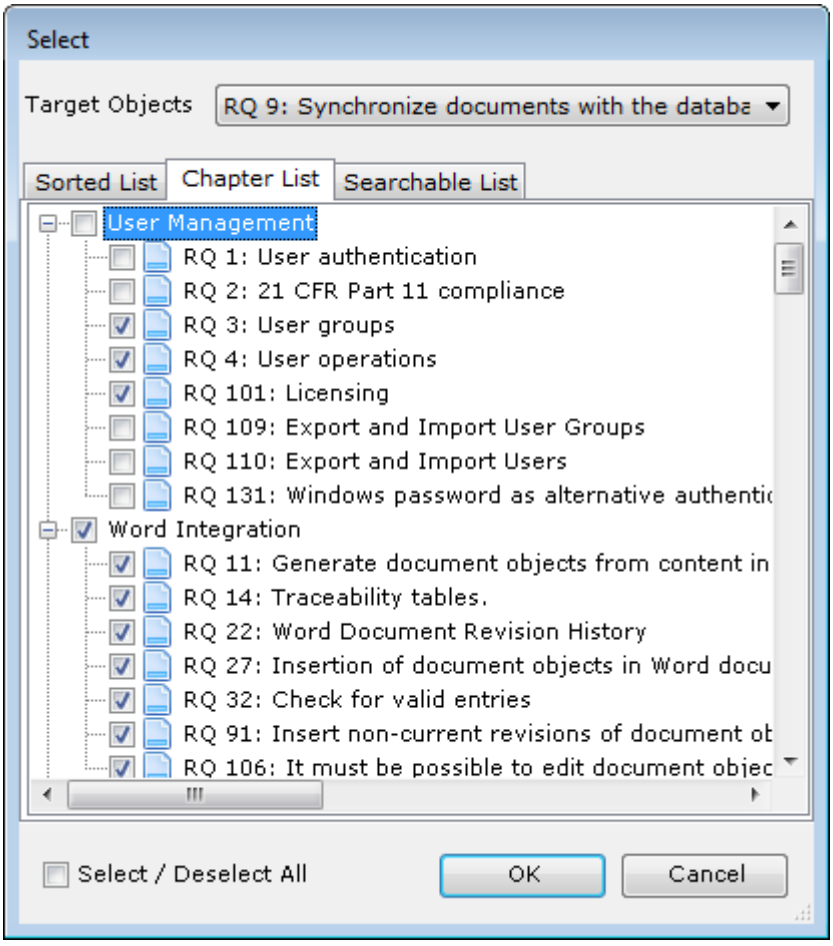
- **Using *“Generate”* in the Project Explorer**
  When you use the generate function in the ***Project Explorer*** generate a test case from a use case or generate a risk analysis from a specification a trace is automatically created between the two objects. Automatic traces are also set in failure modes to any Hazards and further on to any created mitigations (see 3.8, Perform a).

Generating an object also implies that attribute values are copied from the original to the generated document object for all attributes that have the same name and type in both the original and generated document object type definition.

The generation mechanism attempts to place the generated Document Object in the same chapter path as the original object, provided that such a chapter path exists. If it does not exist, the generated object will be placed under the root of the Document Object Type.



- **Using the *Trace To/From* context menu option in the Project and Trace Explorer**
  Right-click on one or more document object in the ***Explorer*** to activate the context menu and click the ***Trace To/From*** context menu option to open the ***Select*** dialog.



In this dialog, select the document objects you want to create traces to and click ***<OK >***. You can also use this dialog to remove existing traces by simply unselecting these document objects in the ***Select*** dialog. If you have loaded any linked projects (see 3.26), you may also set traces to/from document objects from these projects.

In the Chapter List, the chapter structure of the selected type is displayed. You have the possibility to select single objects or all objects that below to a chapter.

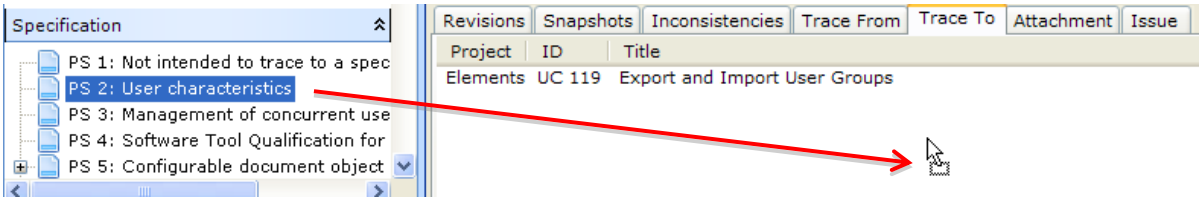
In the Searchable List, you have the possibility to search for keyword in the title of the potential traces. The List uses a fuzzy logic approach to find potential matches.

- **In the Document Object Form's *"Trace To / From"* tab in the Detail View**
  In the detailed view for any document form, you have the possibility to create traces from the current document object to other objects. Right click in the tab page to activate the context menu and select the ***Set Trace*** menu option to open the ***Select*** dialog. In this dialog, select the document objects you want to create traces to and click ***<OK >***. You can also use this dialog to remove existing traces by simply unselecting these document objects in the ***Select*** dialog.

  Another way to remove traces is to mark one or more entries in the detail view and to select the ***Remove Traces*** menu option in the context menu.

  This is also what a way to create Attachments or Issue to your document object in the Attachment and Issue tab page respectively.

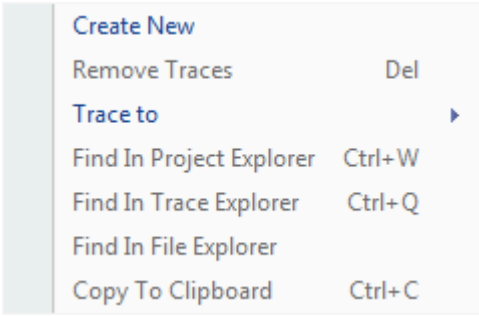
- **Drag an object from the *Project or Trace Explorer* onto a tab in the detail view of a Document Object Form**
  You can also drag a document object from the ***Project or Trace Explorer*** onto the tab of the Detail View. Depending on if you drop the document object in the ***"Trace To"*** or ***"Trace From"*** tab, a trace is created to or from the displayed document object to/from the dragged and dropped document object. You may also drag issues to the Issue tab in the same way.



- **Drag and Drop in Project and Trace Explorer**
  You can also set a trace using drag and drop inside the ***Project and Trace Explorer***. Select one or more document objects in the ***Project or Trace Explorer*** Tree View and drop them on the object you want to trace these objects from. You will be prompted with a message box to acknowledge the setting of the trace(s). To remove a trace in the ***Trace Explorer***, right-click on the child object of the trace and select ***Remove Trace*** in the context menu.

3.5. Adding and creating an Attachment

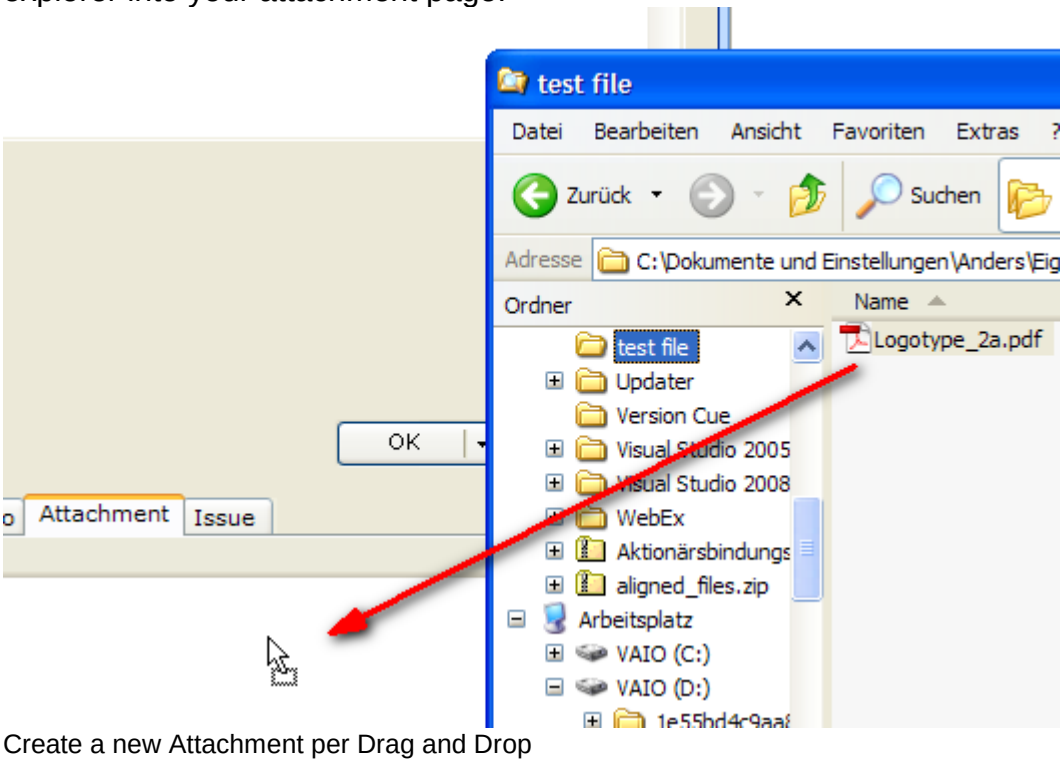
An attachment is a neutral document object that contains a file (like an attachment to an email). Since Attachments are just like any other document object, they can be attached to several “parent” document objects by tracing.



To trace an attachment to a document object, open the document form (double-click on the document object in e.g. the ***Project Explorer***) and select the tab ***Attachments*** in the detailed view at the bottom of the form.

Right click in the list to get a context menu containing two options. Here you can either set a trace to already existing attachments or create new attachments. A ***Document Object Form*** for the attachment document object is displayed when selecting the Create option. In this form you can write a title and a description of the file you intend to attach. To attach a file, click on the ***<Browse >*** button and browse to the intended document. Any document type (word documents, pdf, jpg images etc.) that your PC can display is valid as attachment files.

Hint: When you create a new attachment you can also just drag and drop your file from your windows explorer into the attachment tab or use Ctrl-C / Ctrl-V to “copy” a file from a windows explorer into your attachment page.

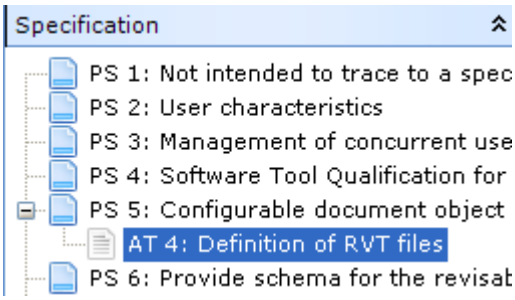


Create a new Attachment per Drag and Drop

After the file is linked to the attachment, you can click on the ***<hyper link >*** to display the file itself. The file will then be displayed in its default application (e.g. Micrsosoft Word, Adobe Reader, Paint etc.).

Click **< *OK* >** in the Attachment Form to save the new object. You will now see the attachment listed in the detail view of your original document object.

Attachments are displayed in the ***Project Explorer*** below their parent document objects.



3.6. Perform a Query

A query is a way to filter out Document Objects based on certain filter criteria. In Aligned Element you can add Queries, modify, copy and rename Queries and also delete them. A query essentially consists of:

- an input set of document objects
- a number of filters

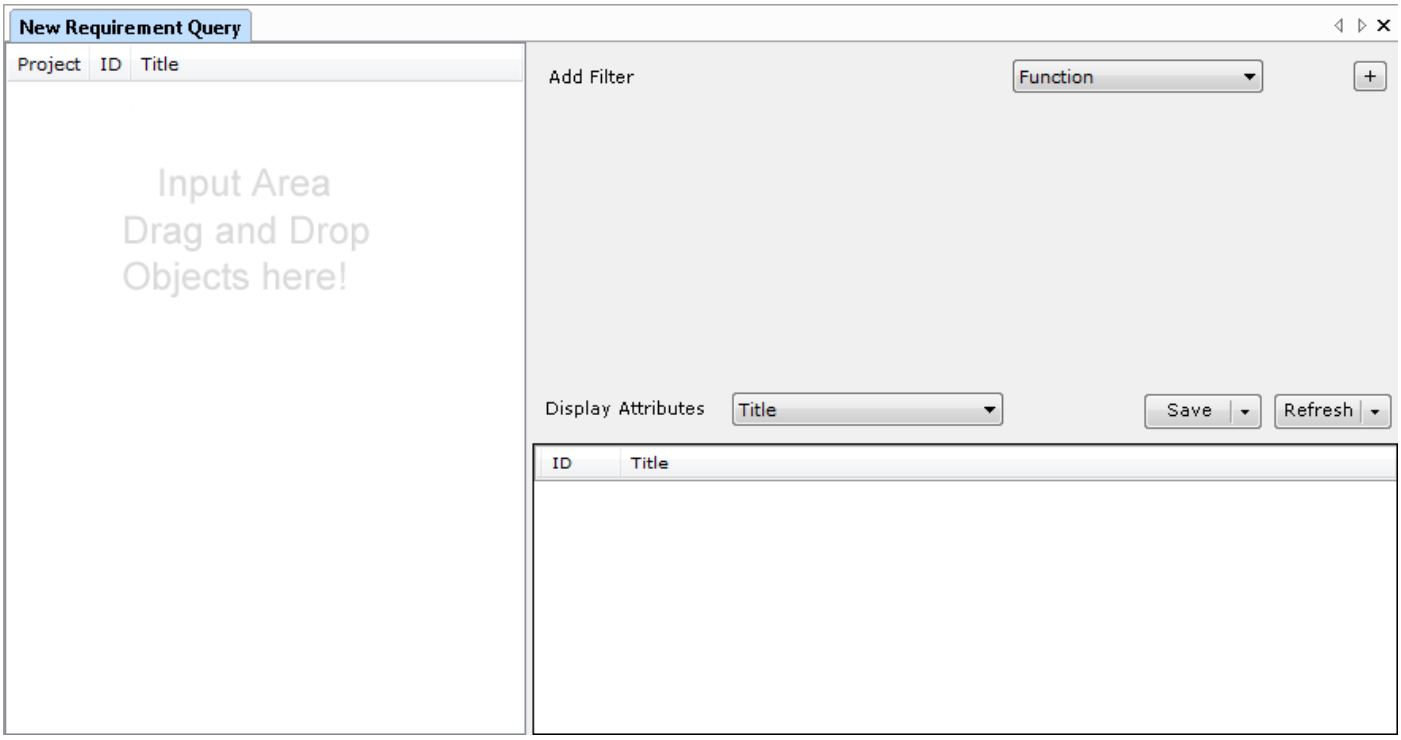
These two in combination yield an output set of Document Objects. Queries can be performed on current Document Objects in the master project and the linked projects. Objects from snapshots or of older revisions cannot be included in a Query.

To create a Query, click ***Query -> New…*** in the main menu. As a second step you define the target Document Object type for your query. A Query can only be performed on a Document Objects of the same type e.g. Requirements or Specifications.

The third step is to define if you want to use a ***Static*** or ***Dynamic Input Set***. The difference can be explained as follows:

- A ***Static Input Set*** consists of a defined number of document objects. If a Document Object becomes disabled, it is automatically removed from the input set. If a Document Object in the input set is modified, the input set is updated to include the new revision of the object. However, if a Document Object created/added, it is NOT automatically added to the input set. The user has to explicitly add it to the input set using drag-and-drop.
- A ***Dynamic Input Set*** consists of a defined number of chapters (and optionally their sub chapters) and implicitly of all Document Objects in those chapters. The set is updated for disabled and modified Document Objects just as for Static Input Sets. The big difference is that a Dynamic Input Set ***automatically includes*** Document Objects that have been created/added or moved to its chapter set.

When the input set type has been defined, the Query form is displayed.

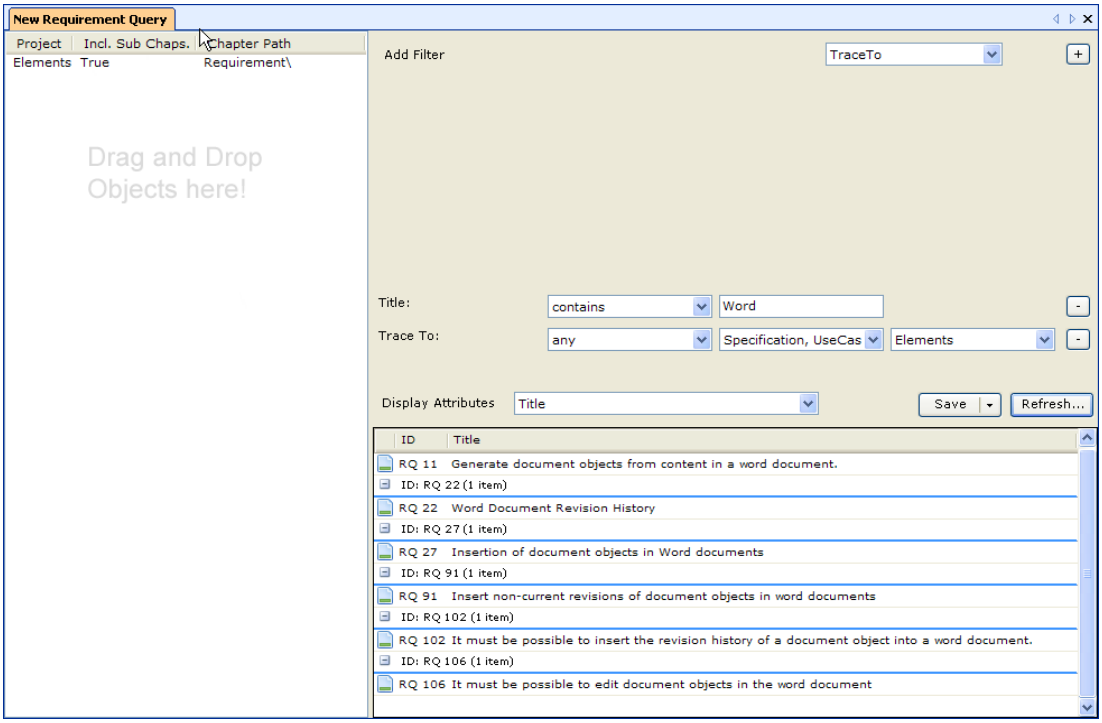


Drag and drop Document Objects or chapters from the Views and Explorers into the Input List on the left side. You can click on the headers to sort the Input set or double click on an item to display it.

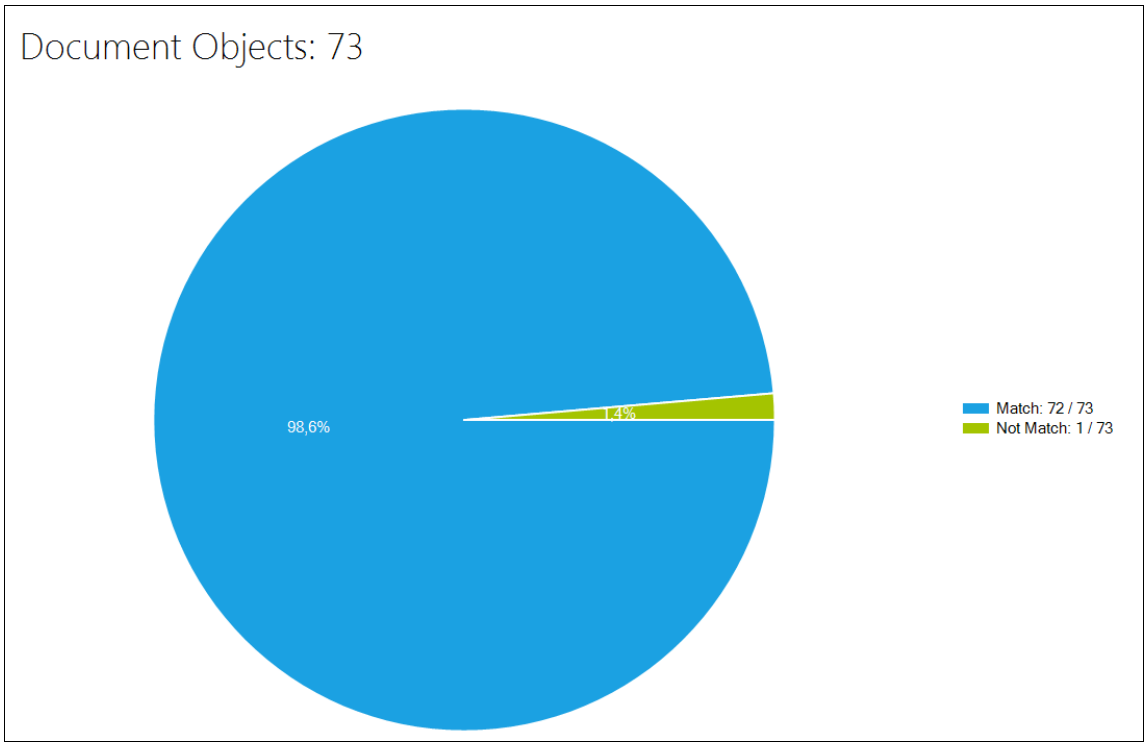
Note! When dragging and dropping a File Object containing a word document that holds Document objects into the Input List, the ObjectsInFile of the File Object corresponding to the target Document Object type of the query are listed in the Input List. This is only available when using a Static Input Set.

Then select and add filters using the plus sign next to the Filter selection box.

As a next step, define the Attributes be included in the Output grid. A separate column is created for each attribute.



Click ***Refresh*** to update the Output set. The output set can be sorted by clicking on the headers. Use the Refresh drop down button to ***Display the matches as chart*** (matching Document Objects in relation to non-matching Document Objects).



Click ***Save*** to commit the query. If the Query has not been saved before, you will be prompted to add a (unique) name for the query. You can also use the Save Drop Down button to ***Rename*** the Query or to ***Create A Copy*** of an existing query.

Use the ***Delete*** button to delete the Query.

Note!

- *Queries are really deleted, not disabled. You cannot re-access a deleted Query.*
- *The Filters are combined using the AND rule.*

3.6.1. Attribute Value Filter

Matches Document Objects that corresponds to the given value of the selected attribute. First select the attribute to filter on, then set the Modifier to either “contains” , “not contains”, “is empty” or “is not empty” and then enter the attribute value (or part of the attribute value).

E.g. the following Filter yields all objects that have a ***Description*** that does not contain the word “blue”.

Note!

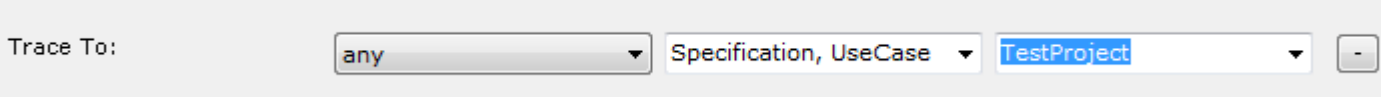
- *This filter is case-insensitive. Quotes do not apply.*
- *Aligned Elements provides the option to use Sql Server full text search to increase the performance of attribute queries, see Using Sql Server Full Text Search*

3.6.2. Trace To Filter

Matches Document Objects that trace (or not trace) to Document Objects of a given type in given projects. Select the Document Object Type to trace to (can be one or more), then in which Projects these traced objects may reside and finally set the Modifier to either “any”, “all” or “none”. The Modifier work as follows:

- Trace to ***“any”*** of “Specification” and “Use Case” yields objects that trace to at least one Specification OR at least one Use Case (or both).
- Trace to ***“all”*** of “Specification” and “Use Case” yields objects that trace to at least one Specification AND at least one Use Case.
- Trace to ***“none”*** of “Specification” and “Use Case” yields objects that do not trace to any Specification or Use Case.

E.g. the following Filter yields all objects that have at least one **trace** a Specification **OR** a Use Case in the **Master Project "Test Project".**

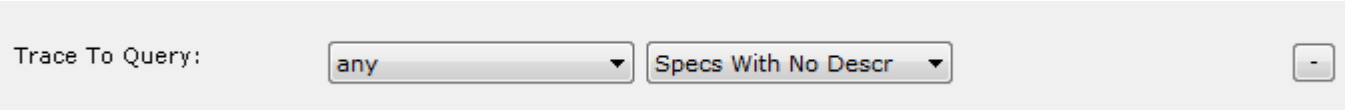


3.6.3. Trace To/From Query Filter

Matches Document Objects that trace (or not trace) to/from Document Objects in the Output set of other Queries. You can use this filter to combine Queries. Set the Modifier to "any", "all" or "none" and then the Query that contains your target set. The Modifier work as follows

- Trace to ***"any"*** yields objects that trace to at least one object in the Target Query Output set.
- Trace to ***"all"*** yields objects that trace to all objects in the Target Query Output set.
- Trace to ***"none"*** yields objects that trace to none of the objects in the Target Query Output set.

E.g. the following Filter yields all objects that have at least one **trace** to an object that is member of the Target Query's Output set.

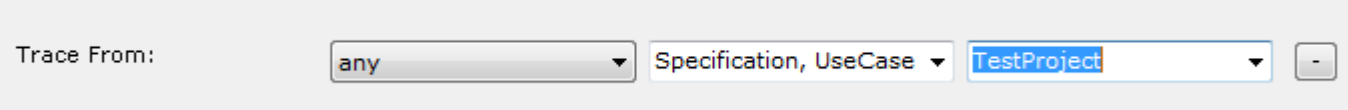


3.6.4. Trace From Filter

Matches Document Objects that have incoming traces from Document Objects of a given type in given projects. Select the Document Object Type for the incoming traces (can be one or more), then in which Projects these incoming-trace objects may reside and finally set the Modifier to either "any", "all" or "none". The Modifier work as follows:

- Trace to ***"any"*** of "Specification" and "Use Case" yields objects that have incoming traces from at least one Specification OR at least one Use Case (or both).
- Trace to ***"all"*** of "Specification" and "Use Case" yields objects that have incoming traces from at least one Specification AND at least one Use Case.
- Trace to ***"none"*** of "Specification" and "Use Case" yields objects that do not have incoming trace to any Specification or Use Case.

E.g. the following Filter yields all objects that have at least one incoming **trace** from a Specification **OR** a Use Case in the **Master Project "Test Project".**



3.6.5. Revision Date Filter

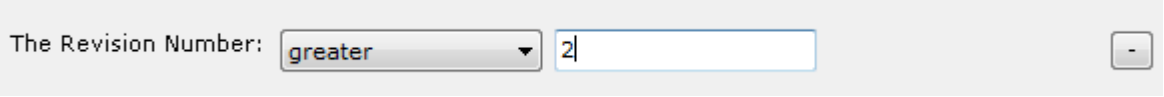
Matches Document Objects that have been created or modified before or after a certain date. Set the Modifier to ***"created before"***, ***"created after", "modified before", "modified after"*** and then set the target date.

E.g. the following Filter yields all objects that have been modified after April 18th.

3.6.6. Revision Number Filter

Matches Document Objects that have a revision number greater, less, equal or not equal a certain number.

E.g. the following Filter yields all objects that have been modified more than twice.



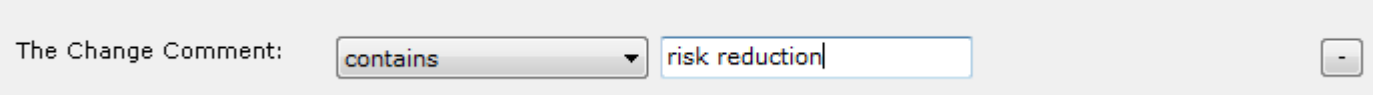
3.6.7. Revision Author Filter

Matches Document Objects that have a revision author that has created/not created, modified or not modified an object.

E.g. the following Filter yields all objects that have been created by the user "Kallis".

3.6.8. Revision Comment Filter

Matches the Document Objects where the most current revision has a Change Comment containing or not containing a particular word.

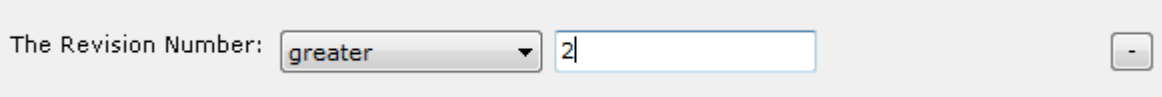


3.6.9. Inconsistency Filter

Matches Document Objects that have (or have not) a certain inconsistency. Select the Inconsistency Type and then set the Modifier to either “any”, “all” or “none”. The Modifier work as follows:

- Modifier ***“any”*** of Inconsistencies “Issue Open” and “NotReviewed” yields objects that have at least one open issue OR is not Reviewed (or both).
- Modifier ***“all”*** of Inconsistencies “Issue Open” and “NotReviewed” yields objects that have at least one open issue AND is not Reviewed.
- Modifier ***“none”*** of Inconsistencies “Issue Open” and “NotReviewed” yields objects that have no open issue AND is Reviewed i.e. that have none of the described inconsistencies

E.g. the following Filter yields all objects that have an issue open **OR** is not Reviewed.

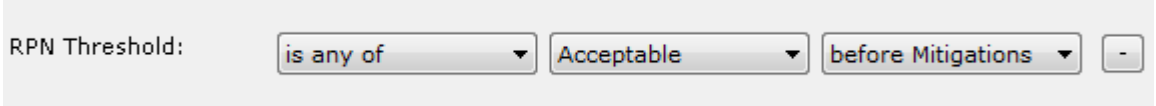


3.6.10. RPN Filter

The filter allows you to define a query based on the calculated RPN value. It only applies to document object types such as Failuremode or RiskAnalysis and their underlying Hazard/ProbabilityOfHarm.
You can apply the filter before or after Mitigations and include the RPN and/or RPNThreshold values in the query result.

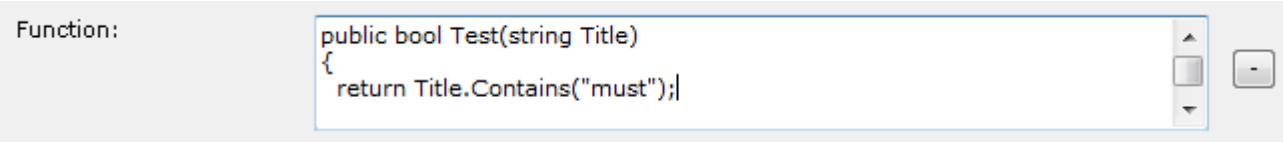
3.6.11. RPN Threshold Filter

The filter allows you to define a query based on the calculated RPN Threshold (e.g. Acceptable, In-Acceptable, ALARP/ALAP). It only applies to document object types such as Failuremode or RiskAnalysis and their underlying Hazard/ProbabilityOfHarm.
You can apply the filter before or after Mitigations and include the RPN and/or RPNThreshold values in the query result.

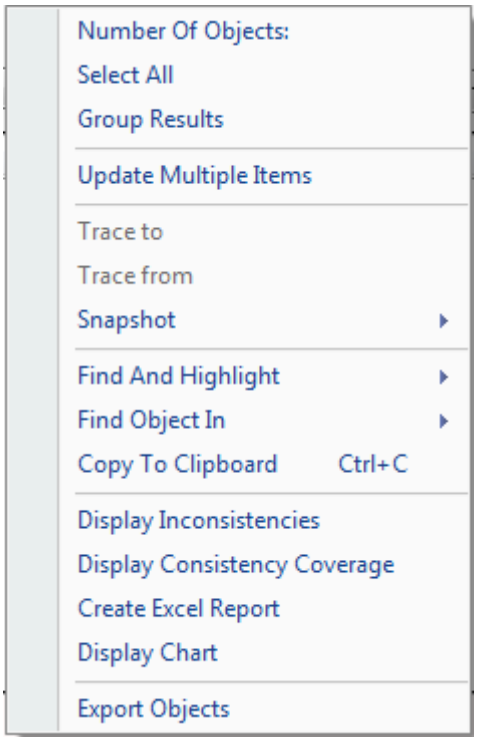


3.6.12. Function Filter

The filter allows you to define a complex condition using c# syntax. The result of the function must be a Boolean (true/false) and as parameters any Document object attribute string values can be defined where the name of the parameter is the name of the attribute.



3.6.13. The Query Output List



The context menu of the Output List contains the following options:

- ***The Number of Objects*** that meet the filter conditions.
- ***Select all*** objects displayed in the list.
- **Toggle** between List and Tree display of the objects.
- ***Display > Expand / Collapse*** all entries (only valid for Tree display)
- ***Update Multiple Items*** in batch mode.
- ***Set Traces To / From*** the selected objects
- ***Set Snapshot*** on Selected or on All Document Objects in the output view.
- ***Find And Highlight*** a particular word in the output list.
- Find the Document Object in a ***Project Explorer, Trace Explorer or File Explorer***.
- ***Copy*** the selected objects to the clipboard for offline editing.
- ***Display Inconsistencies*** on the selected Document Objects.
- ***Display Consistency Coverage*** on the selected Document Objects.
- ***Create Excel Report*** to create an Excel file of the Document Objects in the Output Set.
- ***Display Chart*** generates a breakdown chart for the selected objects.
- ***Export*** the selected Document Objects

You can also use drag and drop items from the Query Output to the ***Project*** or ***Trace Explorer*** to set traces.

Furthermore, Query Output Sets can be used in the Word Integration, see more information about this at 4.9.

3.7. Create and run a Trace Table

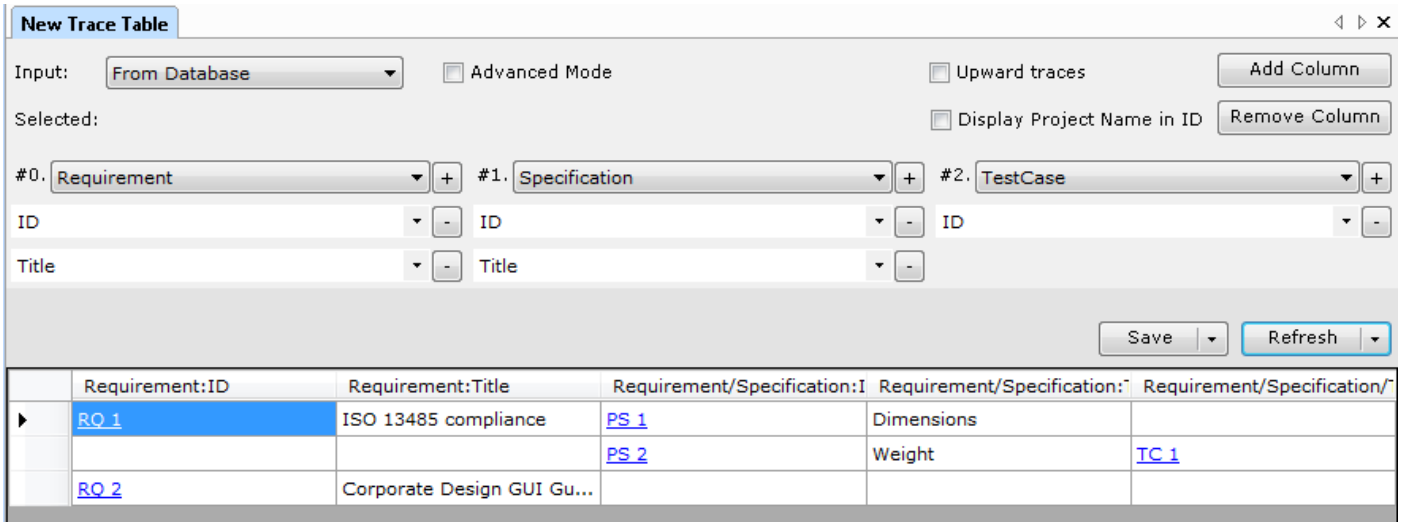
A Trace Table is a table where the traceability between Document Objects is depicted as table row, showing the trace chain from left to right. In Aligned Element you can create, run, modify, copy, rename and delete Trace Tables.

The Trace table essentially consists of three parts:

- an input set of document objects
- a number of column definitions defining the trace chains
- the output view, running the input set through the column trace chain definitions

Trace Tables can be performed on current Document Objects in the master project (when using the From Database, Query or Custom input set) and the linked projects (when using the Query input set). Document Objects from snapshots or of older revisions cannot be included in a Trace Table.

To create a Trace Table, click ***Traces -> New Table…*** in the main menu.



Use the buttons ***Add Column*** and ***Remove Column*** to add and remove columns. Columns are added and removed from the right.

Each column is of a designated ***Document Object Type***. Furthermore, use the ***plus*** and ***minus*** buttons to add the attributes to be displayed for the Document Object Type. In the output view, each attribute is displayed in a separate column. The IDs are displayed as hyperlinks. Double-click on an ID to open the Document Object in the Document Object Form.

To run the Trace Table, click ***Refresh***. This will populate the output view with the column definitions. The sort order is based on the IDs in the left most column (the input set). You can also use the ***Refresh*** drop down button to save the Trace Table as ***Excel*** or ***Word*** document.

Click ***Save*** to commit the Trace Table definition to the database. If the Trace Table has not been saved before, you will be prompted to add a (unique) name for the trace table. You can also use the ***Save*** drop down button to ***Rename*** the Trace Table, to ***Save a copy*** of the definition or to use the ***Save as Word Template*** to save the definition as a Word template to be used in Word (see section 4.15).

Use the ***Delete*** button to delete the Trace Table.

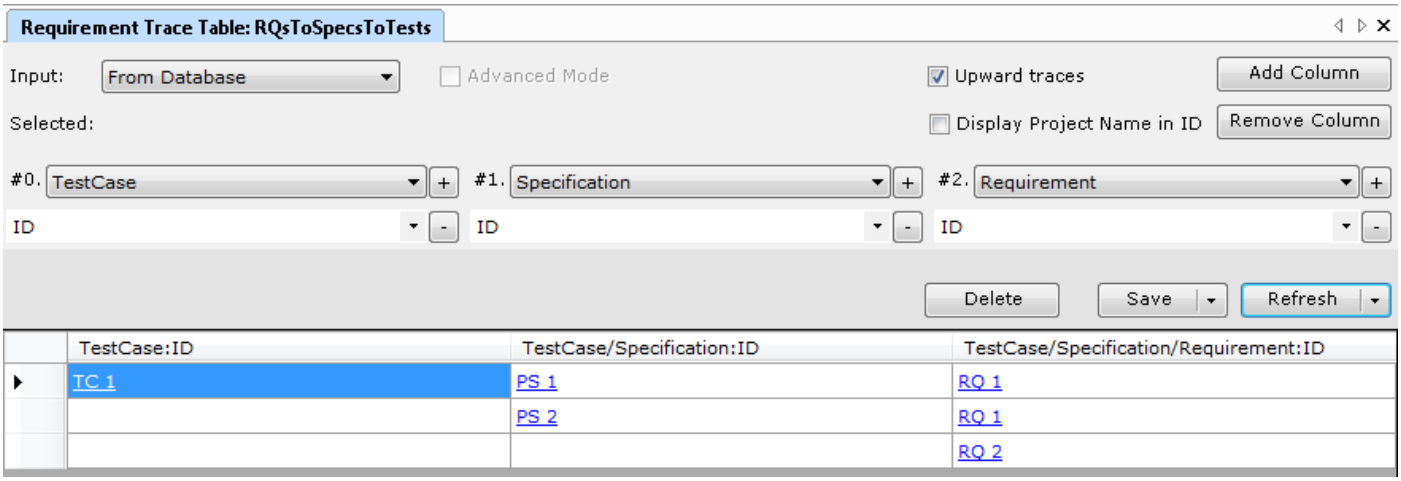
3.7.1. Trace Table Input Sets

The input set specifies the Document Objects that make up the "root" of the Trace Table. These objects are used to populate the trace table's left most column in ascending ID order. There are three different Trace table input set types:

- From Database – all most current document objects of the selected type in the main project
- Query – the Document Objects that are resulting from the selected query.
- Customized – a hand-picked set of Document Object among the most current document objects of the selected type in the main project.

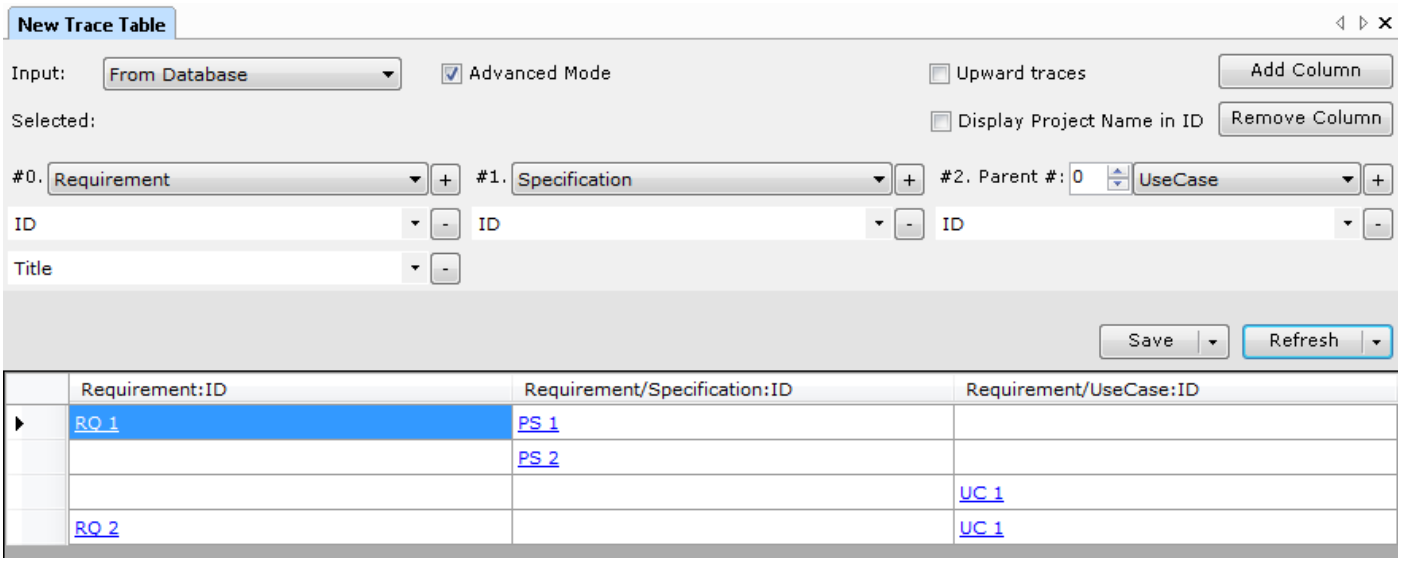
3.7.2. Upward trace tables

Tick the checkbox ***Upward traces*** to define a Trace Table showing traces in the upward direction (remember that Aligned Elements traces are unidirectional, pointing from a source to a target; using the upward trace table enables depiction in the reverse direction).



3.7.3. Trace Tables in Advanced Mode

Tick the checkbox ***Advanced Mode*** to activate a multi-branch Trace Table.



When activating this mode, all columns to the right of the second column receives an additional number selection field for specifying the parent column. In the example above, the third column (the Use Case column) specifies the first column (the Requirement column) as parent column.

In the output view, the second column shows specification tracing from the requirements in the first column and the third column shows use cases tracing from requirement in the first column.

3.8. Perform a FMEA

When performing an FMEA, three different document object types are involved. The central document object is the Failure Mode that contains and combines entered causes and effects into Hazards (which is the second document object type involved). Hazards generate a Risk Probability Number which grades how serious the danger of the hazard is. The Risk can be reduced by creating and assigning Mitigations to the Hazard.

Failure mode, Hazards and Mitigations are connected through traces visible in the ***Trace Explorer***.

A Failure Mode is generally an output from a specification i.e. “what risks are involved in the requirement solution being specified in this way”. However, it is also possible to create Failure modes as free standing objects.

To perform a FMEA (Failure Mode Effects Analysis) risk analysis:

1. Generate a Failure mode from e.g. a specification via the context menu in the ***Project Explorer*** (right-click with the mouse on a specification and select ***Generate Failure mode***)

2. In the Failure mode document object form you can describe the Failure mode in the title which is usually a functional family which applies to the specification. E.g. for the specification Create analyses of serum you could have the failure mode No result created.

3. Define one or more effects for the Failure mode and quantify their severity according to your company standards.

4. Define one or more causes for the Failure mode and quantify their probability according to your company standards.

5. As you see, each permutation of the listed causes and effects generates a hazard in the Risk table in the lower part of the form.

6. Define the visibility for the Hazard and quantify it according to your company standards.

7. The risk probability number (RPN) is calculated as severity (from the effect) x probability (from the cause) x visibility (from the combination of cause and effect).
   An acceptable RPN is displayed in green. However, if the RPN is higher than a pre-defined threshold (configurable as described in 6.7.4), the number is displayed in red. Optionally you may also configure an intermediate level, ALARP (as low as reasonably possible), in which case the RPN would display itself in yellow.

8. For the generated hazards you may add Mitigations with the intention to reduce the RPN to an acceptable level.

9. To create a new mitigation click on the **< *New* >** button for the applicable hazard. The Mitigation is traced from the Hazard which means that the Mitigation can be assigned to other Hazards in this or other Failure Modes by clicking the **< *Add* >** button on the applicable row.

10. To edit an existing mitigation click **< *Edit* >** button for the applicable hazard. Since the mitigation is traced to one or more Hazards the changes are propagated to all Hazards tracing to this Mitigation.

11. In the Mitigation form you can set the reduction for either the severity or the probability or the visibility. By atomizing the reduction of a Mitigation in this manner, the application of the Mitigation on other Hazards is facilitated.

12. When you finish the editing of the Mitigation you will see the impact of the reduction of the risk factors through the mitigation. It is calculated as the new RPN (NRPN).

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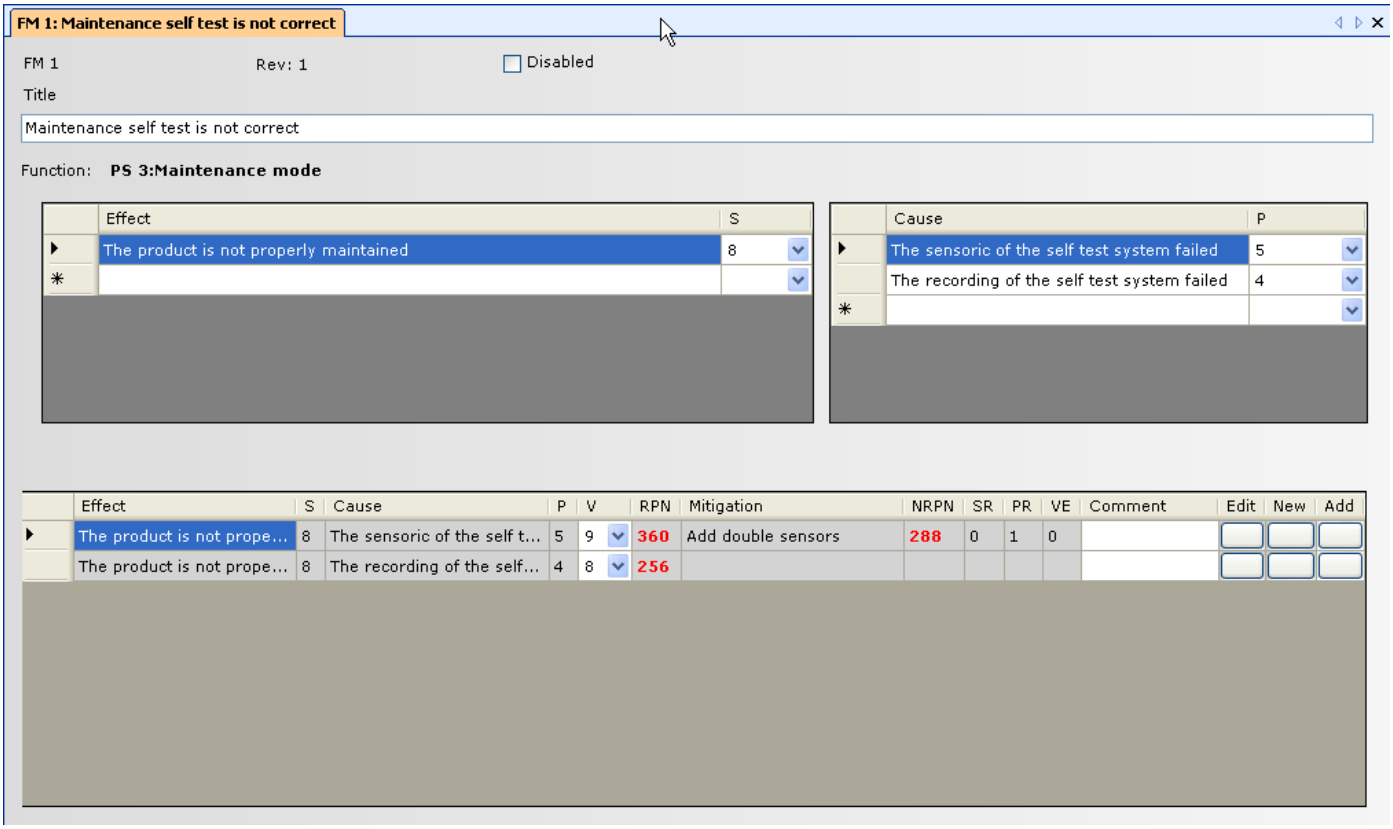


Failure mode form containing one effect and two causes which render two Hazards where the first is mitigated by a Mitigation lowering the Probability of the cause with 1.

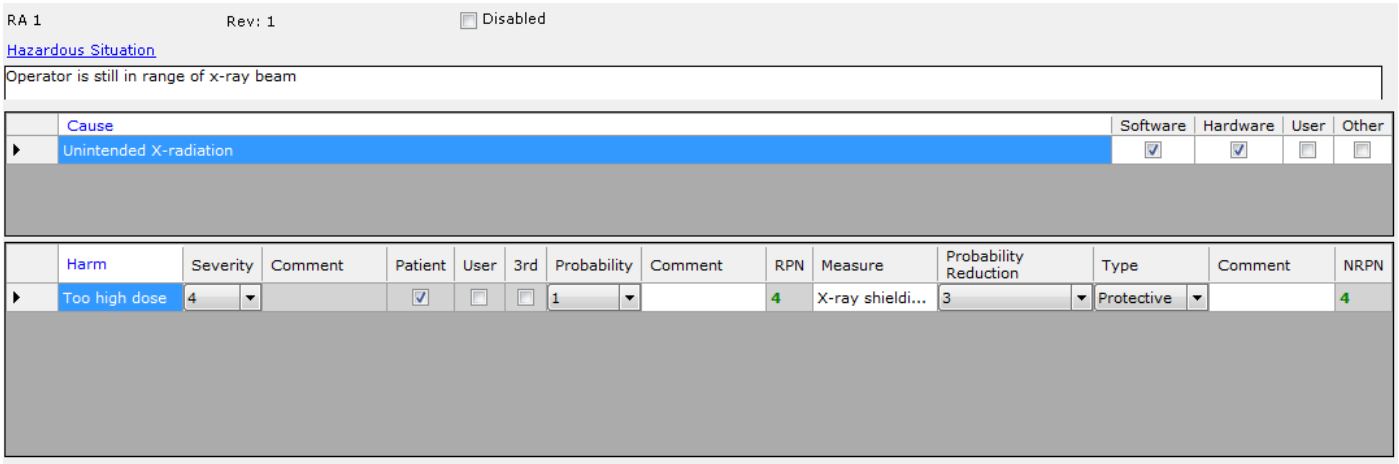
Note!

- *To remove a Mitigation from a Hazard, click the **< Add >** button in the applicable Hazard row and deselect the Mitigation in the Select dialog and click **< OK >.***

- *To remove a Hazard from the Risk table, remove either the applicable Cause or Effect by selecting a row in the Effect or Cause table (click on left most part of the row to select the entire row) and click Delete on your keyboard.*

3.9. Perform a Risk Analysis

When performing an Risk Analysis (also known as Preliminary Hazard Analysis), five different document object types are involved. The central document object is the Risk Analysis that describes the hazardous situation. It links to Harms and optionally Measures in the system and keeps these link as a Probability Of Harm object. As input to the Risk Analysis, zero or more Causes may be defined.



Note!

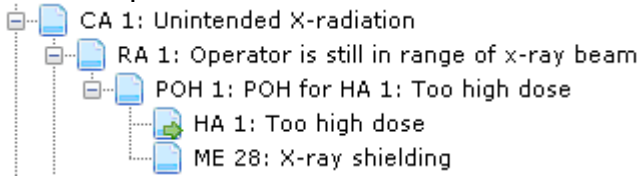
- *Causes, Measures and Harms can only be created directly from the Project Explorer.*

Causes, Measures and Harms can be assigned to the Risk Analysis either per Drag'n'Drop from the Project Explorer, or via the context menu. To remove an assigned object, please use the context menu.

To create a Risk Analysis as above, please follow these steps:

1. Create a Harm, Measure and Cause (in any order)
2. Create a Risk Analysis object
3. Assign the Cause to the Risk Analysis (top table)
4. Assign the Harm to the Risk Analysis (bottom table). Here Aligned Elements automatically creates a ProbabilityOfHarm object.
5. Set the probability for the row.
6. Assign the Measure to the Risk Analysis (bottom table)

The example above would look like this in the Trace Explorer:



Measures and Causes may be edited directly in the Risk Analysis form whereas Harm can only be edited when opened from the Project Explorer.

3.9.1. Potential Hazard

Sometimes it is useful to keep track of what the Risk Analysis is applied to. For this we recommend having a Potential Hazard as a placeholder in the DHF. The Potential Hazard usually depicts a situation required to be analyzed from your Quality System or some central Norm (i.e. 60601-1).

3.9.2. Using the Risk Analysis to check the Software Safety Classification

You may trace from your Software Items to Causes included in the Risk Analysis. The Validation rule "Has Consistent Classification" is then added to your Software Item type and will signal if the

Software Item has the correct classification according to 62304. Please contact Aligned AG for configuration options.

3.10. Perform a Review

Aligned Elements offers a structured approach to conduct reviews of document objects. A Review document object works like any other document object in Aligned Elements and operates via a combination of attributes and traces.

A document object is considered as reviewed if the revision of the document object is part of an open or a close

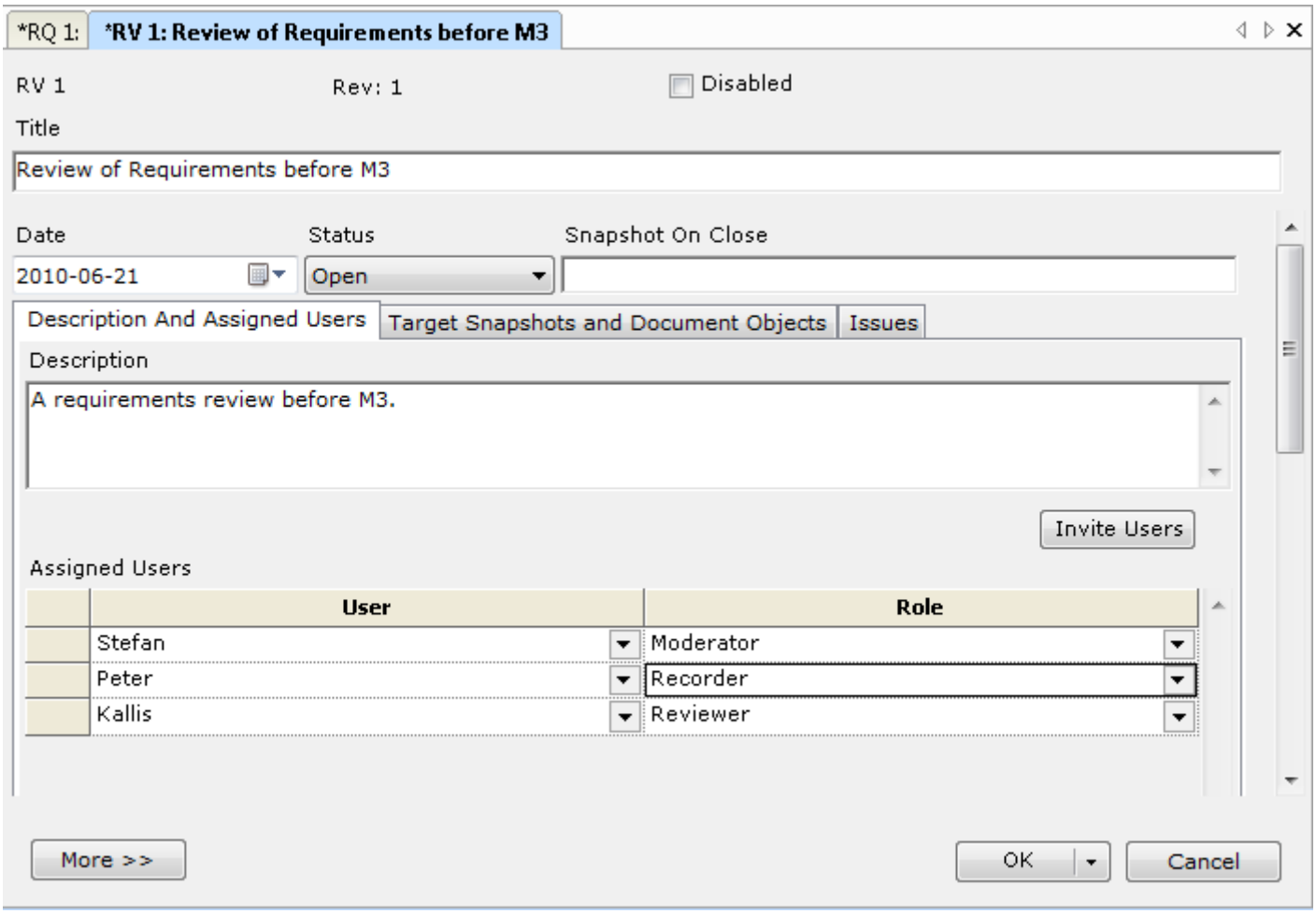
Three important set of document objects are involved in a Review.

- First there is the review itself (which is a document object) acting as main container of the review process.
- The second set is the *Document Objects Under Review* i.e. the document objects that we are reviewing which essentially are defined by one or more snapshot. The review uses snapshots in order to define the start state of the document objects to be reviewed.
- The third set contains the Issues generated by the review process. These issues are meant to sum up the tasks that have been completed before the Review is successfully closed.

How to perform a Review:

1. Create a new review in the ***Review View*** (see 2.7.5).
2. In the ***Document Object Form***, add a review description (usually stating the reason and success criteria for the reviews) and assign the review participants as well as their roles.

3. Define the Document Objects Under Review by selecting a number of target snapshots.



The Review Document Object Form containing a list of issues.

4. When the snapshots have been selected, you will see the Document Objects Under Review in the ***Document Object*** tab listed with their existing inconsistencies.

5. If you have any external documents e.g. guidelines for the review, you may attach them as well as normal attachments

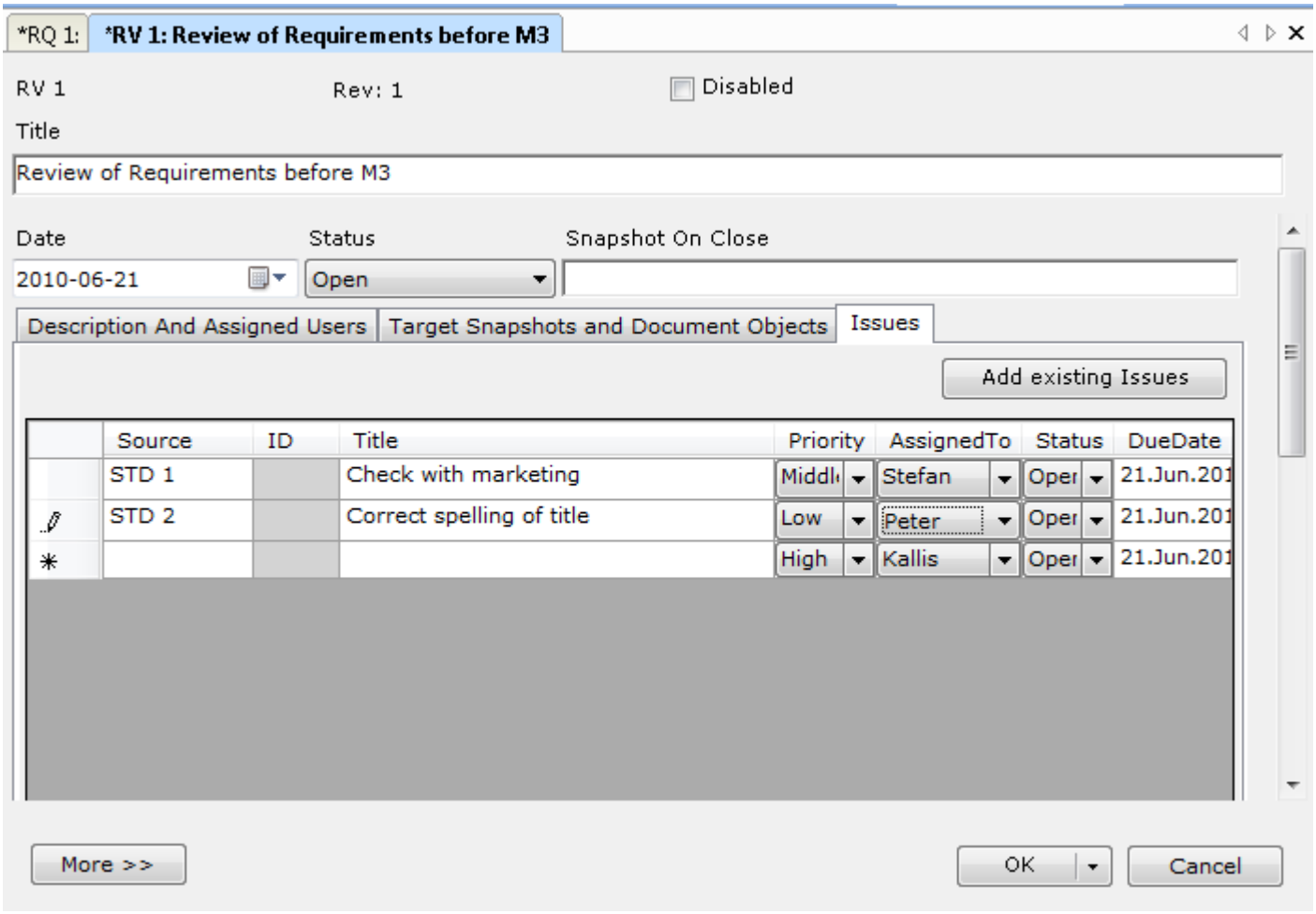
6. Click **< *OK* >** in the Review Document Form to save the review. At the first time you save the review you will be asked if you want to send up an invitation to the included users. If you click **< *Yes* >** and the SMTP mail settings have been set up for all involved users including yourself an invitation will be sent out.

The Review is now prepared. The review participants can access the Review and add any issues that they may find. The issues will be traced from the source Review Document Object.

During the Review you either create new issues or add existing issues to the review.

When the review has been performed, close the review by setting the ***Status*** to ***Closed***. At this point in time, a new snapshot (*Snapshot On Close*) will automatically be created when you commit the Review.

Hint: To view the changes during a review, compare the Target Snapshot with the Snapshot on Close for the particular review.

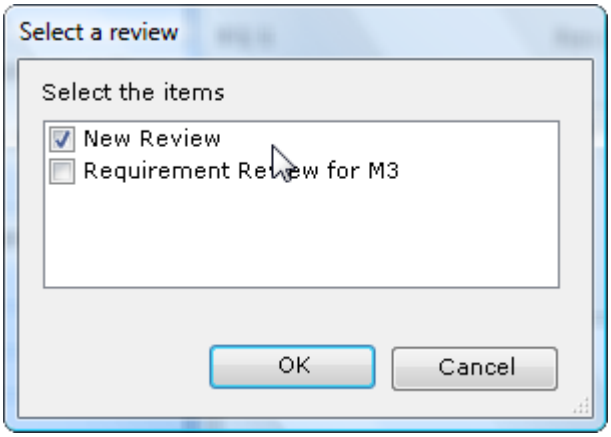


When the review has been completed, you can set the Status to Closed. The issues created in the review do not yet have to be completed to close the review (some issues might also have due time somewhere in the future).

3.10.1. Add To Review using the Project Explorer

In the Project Explorer you have the possibility to select a number of Document Objects (similarly to what you do when selecting objects for a snapshot) and select ***Add To Review*** in the context menu.

As a next step, you are presented with the possibility to select to add the objects to an existing Review or to create a new Review for the selected objects.



After select a Review, you are prompted to add a Snapshot name. When completed, a snap shot has been created for your objects and that snapshot has been added to the selected Review.

3.11. Execute a Test Case

To execute a Test Case document object and create an Executed Test Case. Follow these steps:

1. In the project explorer right-click on the Test Case you want to execute. In the Context Menu, select the entry ***Execute -> ExecutedTestCase***.

2. This will create a new Executed Test Case where the ID number is identical to the ID number from the Test Case. A trace is also created from the Test Case to the Executed Test Case (equivalent to Generate Document Object). Also all attributes that are common to the parent Test Case have been copied to the Executed Test Case. After having created the Executed Test Case, the Execution number will be equal to “1” (first execution of the Test Case).

3. Follow the test case instructions and fill out the additional fields in the Executed Test Case.

4. When you are done with the execution of the Test Case, you can store your new data by clicking **< *OK* >** in the document object control.

5. You can continue working on an Executed Test Case by opening it again. Any changes will be stored as a new revision but the Execution No will remain.

6. If the execution is completed and successful, set the status to “Passed” (or equivalent). If the execution was not successful, set the status to “Failed” (or equivalent).

To re-execute a Test case (the Test Case has already been executed at least once):

1. In the project explorer right-click on the Test Case you want to re-execute. In the Context Menu, select the entry ***Execute -> ExecutedTestCase***.

2. This will create a new revision of the existing Executed Test Case. Also all attributes that are common to the parent Test Case have been copied to the Executed Test Case and any specific Executed Test Case attributes are left blank. The Execution number will be increased by one.

3. Continue working as when you executed the test case the first time.

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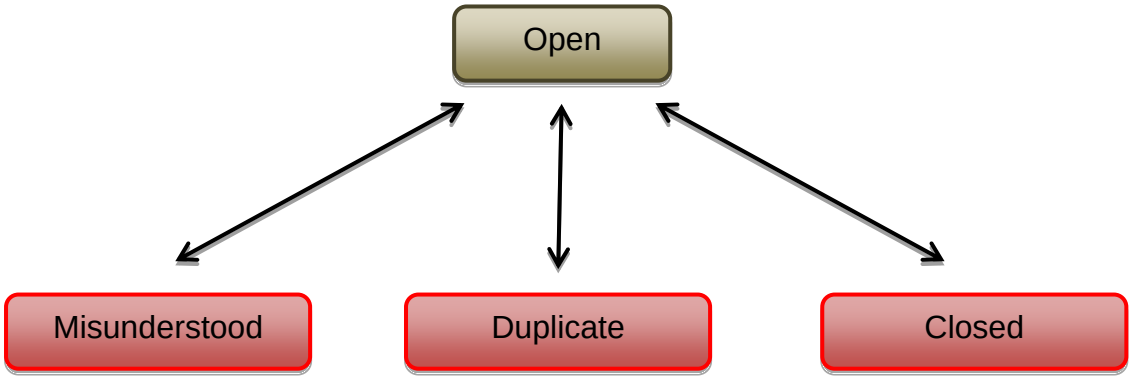
3.12. Implement Workflows

Aligned Elements can support workflows by the use of enumeration attributes. E.g. an issue has the Status attribute which may contain the values Open, Misunderstood, Duplicate and Closed, can be configured to only allow certain transitions between these values. A workflow could be defined to implement the following schema where green is the start state and red the possible end states:



In this example the workflow e.g. prevents changes from Misunderstood to Duplicate, or Close a Misunderstood issue would have to be set to Open before it can be set to Duplicate.

Special transitions can be combined with “Actions”.
Triggered “Actions” include:

- Creating a signature for the Document Object.
- Send an email about the change to a particular User Group.

To define a workflow for a document object type, see 6.7.

Workflows can also be setup with transition permission rules, such as:

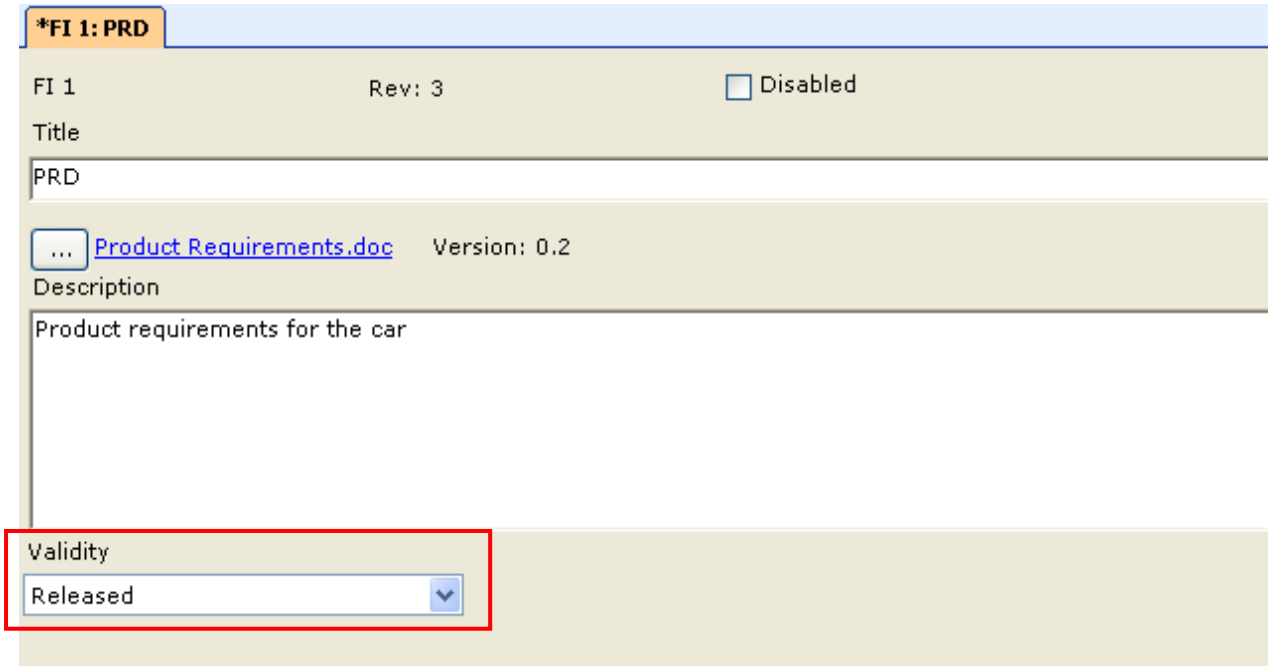
- Preventing members of a particular user group to set a new state.
- Preventing a transitions to be made if a particular consistency constraint is not met (i.e. a particular attribute is not set, a review of the Document Object has not taken place or that the Document Object has not yet been placed in a Word Document).

3.13. Work with Digital Signatures

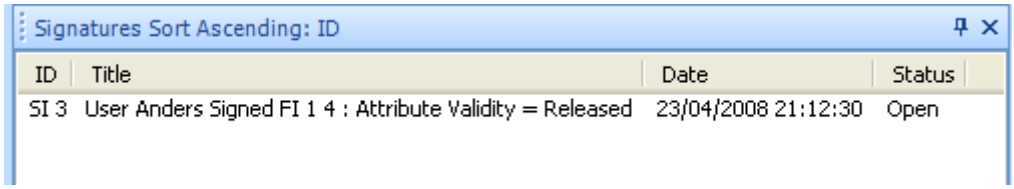
Note! The digital signature functionality is contained in an add-on package and needs to be separately ordered from Aligned AG.

Digital signatures are triggered by a workflow action (see 3.12) and can be applied to any document object type, however for a File Document Object; they have a specific meaning since they would produce a signed PDF/A version of the contained document.

1. In our example, a signature is created when the Validity is changed from Draft to Release for a File Document Object (for any other document object type no PDF will generated and no digital certificate is needed):

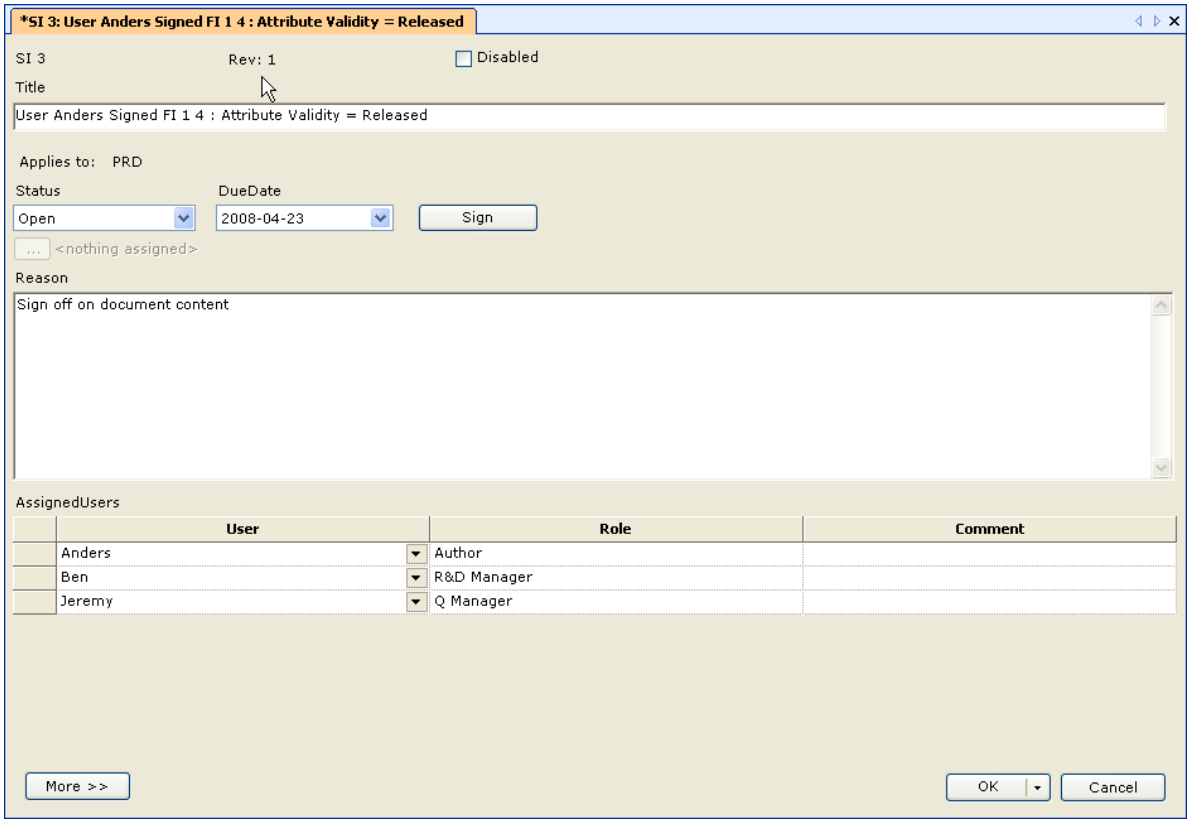


2. When a Signature Document Object has been created as the result of a workflow action, the Signature can be found in the Signature View (if the view is not visible it can be displayed via the Menu Views).



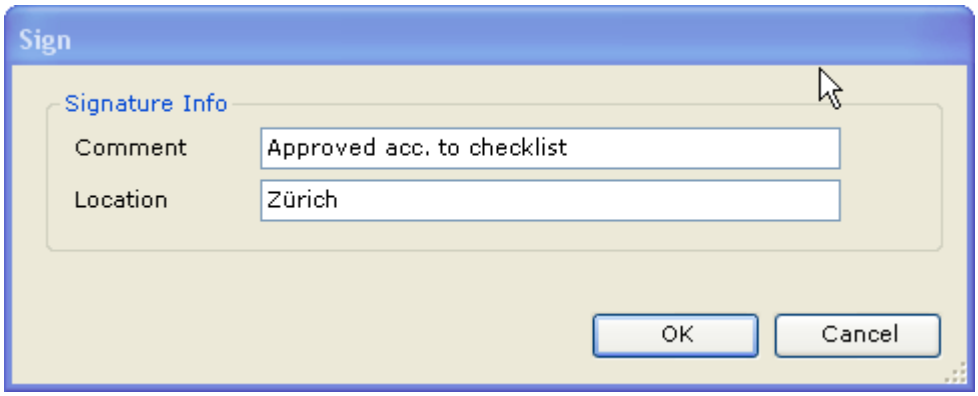
Opening the Signature displays the Signature Document Object. Here you can enter:

- when the signature is due
- the reason for the signature
- the users that need to sign and their roles

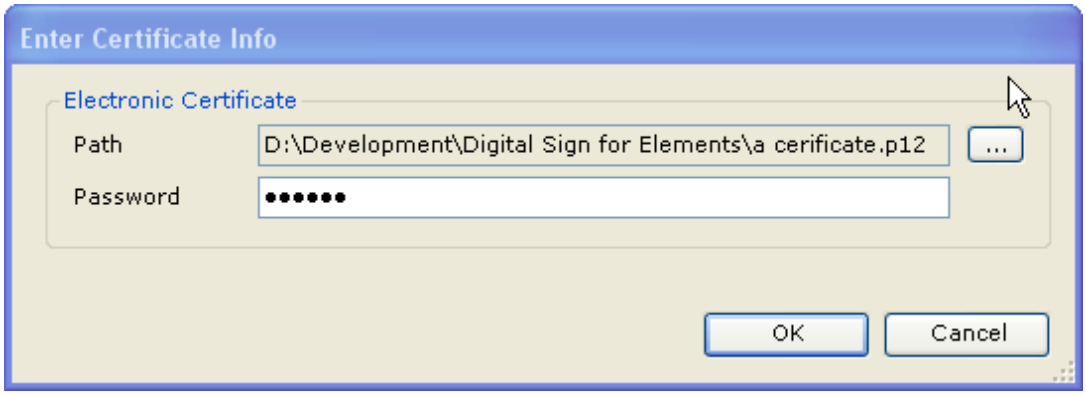


3. Press ***Sign*** you are requested to authenticate yourself with your Aligned Element user and password.

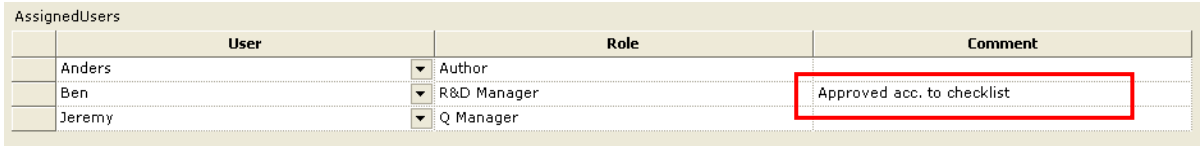
4. The File Document is converted to a PDF/A and is attached to the signature. You are then prompted to add your comment and current location



5. The first time a user performs a signature he/she needs to attach a digital signature which has been saved to a file and supply the password for that certificate.



6. The comment is added to the table of assigned users and a signature is stamped on the 1st page of the PDF which contains the reason, comment, location, local PC time, user name and the digital certificate.

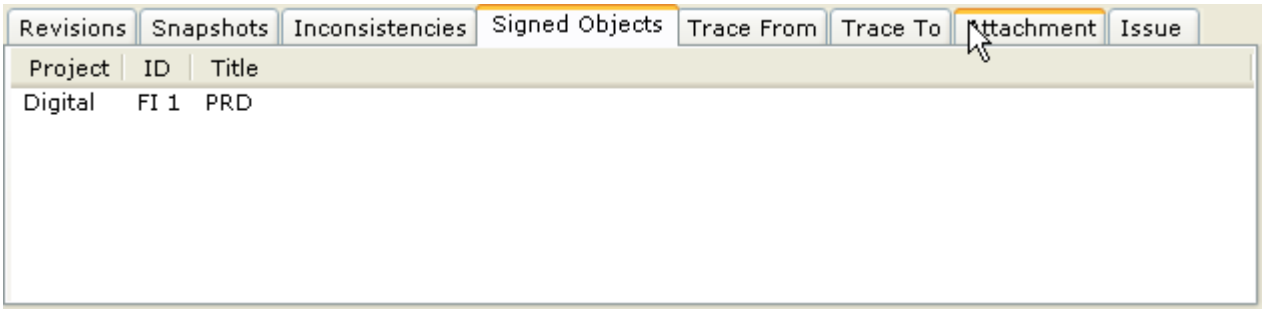


7. Perform the actual signing one user at a time. You can have all users signing on the same client after each other or close the Signature Document Object with OK in-between to allow users on other clients to sign.

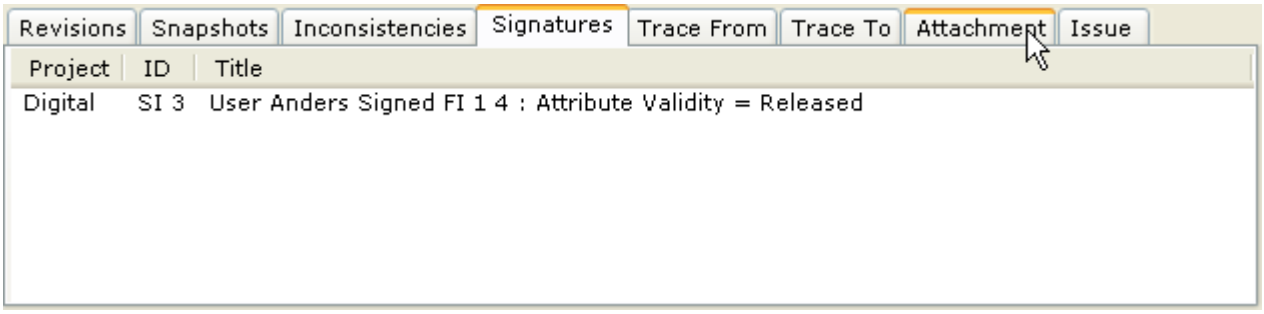
8. When all signatures have been collected you can signal this by setting the status of the signature to Closed.

3.13.1. Navigate with the Detail View

A signature is set on a specific revision of a Document Object. You can navigate from a Signature Document Object to the signed Document Object via the Detail View (click ***<More>*** to display) of the signature:



In the same way you can navigate from signed Document Objects to the current revision of a Signature:



3.13.2. Handling of Digital Certificates

You need to acquire a digital certificate for each user. These must be of the standard X.509 V3 Class I and can be bought from e.g.:

- SwissSign (www.swisssign.com)
- Veri Sign (http://www.verisign.com/certified-document-solutions/individual/index.html)
- TC TrustCenter (http://www.trustcenter.de/en/products/my_certificate.htm)

Aligned Elements will safely store these certificates files for each user in the project database.

3.14. Enable/Disable a Document Object

To disable an object just check the ***Disabled*** check box in the ***Document Object Form*** and press ***<OK>*** to save this change. The disabled document object will then disappear from all ***Explorers***.

Note! Traces to disabled objects are not automatically updated to always trace to the most current revision i.e. after enabling an object again, please revise all traces from the document object and if needed add traces to most current revisions.

To enable the document objects again, select the filter ***Display Currently Disabled Objects*** from the context menu (right-click) in the ***Project History View***.
All currently disabled document objects are now displayed in the view.

Double-click on the row header for the document object in the ***Project History View***. In the ***Document Object Form*** you may now enable the object again by un-checking the ***Disabled*** check box.

The enabled document objects will now appear in the ***Explorers*** again.

3.15. Create a Snapshot

A snapshot is a selected set of document objects in their current revision.
A snapshot is used to unambiguously identify the state of the project e.g. at a project milestone or at a product release or as input for a review.

You can create a snapshot of the project or parts of the project at any time.

To create a snapshot, use the context menu (right-click with the mouse) in an applicable view. When you select ***Snapshot -> On Selected*** (e.g. on a set of chapters and pages), the content of the selected objects (including all sub chapters of selected chapters) and document objects are included in the snapshot.

To create a snapshot of the complete project (including issues and reviews), select ***Snapshot -> On Project*** anywhere in the ***Project Explorer***.

To create a snapshot of an arbitrary set of document objects you can keep the ***<CTRL>*** key pressed to select multiple document objects in the ***Project Explorer*** or ***Trace Explorer*** and create a snapshot of them by selecting ***Snapshot -> On Selected*** in the context menu.

Note! For failure mode like objects, the user is inquired if the corresponding hazards shall be included in the snapshot. Since failure modes and hazards are conceptually closely linked, we recommend this option.

The File Explorer offers a special Snapshot action called ***On Content*** for MS Word Files, which includes all objects inserted (in their current version) in the Word File provided that the objects are not frozen or belong to linked projects.

Display a snapshot by selecting ***Project -> Display Snapshot*** in the file menu. Additional explorers are displayed for the content of the displayed snapshot. When you double click on a document object from a snapshot, you will notice that it is always displayed in read-only mode in the ***Document Object Form***.

Note!

- *The traces displayed for a snapshot only include traces to objects that are part of the snapshot.*
- *Snapshots cannot be set on linked Document Objects or objects from external systems such as Jira Issues or Trac tickets.*

3.16. Compare Snapshots with the Project State

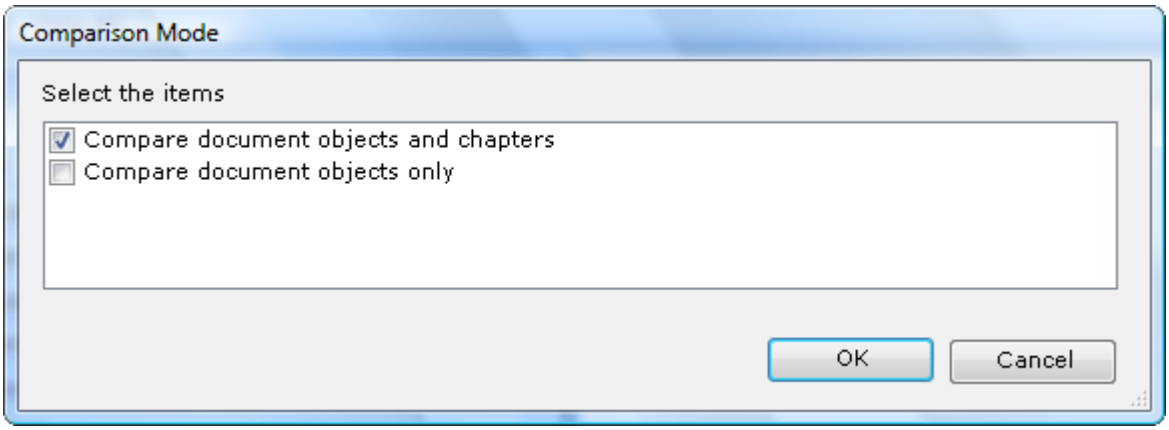
Sometimes it is interesting to find out what the difference between two project states i.e. between two snapshots or between a snapshot and the current project state.
This comparison can be displayed from the ***Project -> Compare Snapshots/Project***.

Select either:

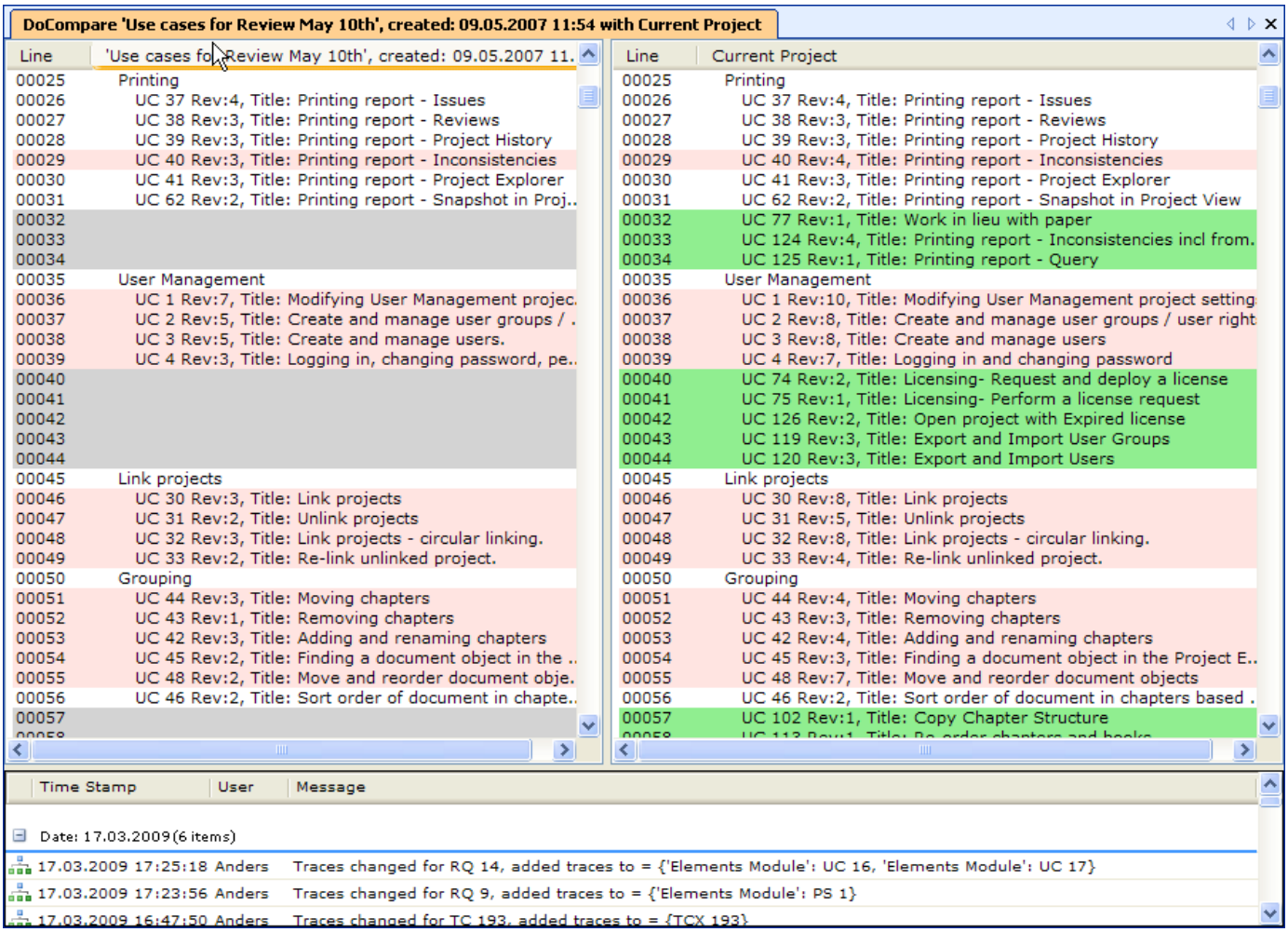
- Two snapshots or
- A snapshot and the current project state

in the selection dialog and press ***<OK >.***

Thereafter a message box is displayed:



- If you select to compare chapters and document objects results in displaying the document objects within their chapter structure. Document object that have been moved are only displayed in the most recent chapter.
- If you select to display document objects only, you may compare revisions of the document objects regardless of their location in the chapter structure.



Changes between two project states are highlighted in the Comparison Form

In the ***Comparison Form*** you see a comparison between the ***Project Explorer*** structure of the two project states and at the bottom of the page, a list of all project history entries recorded between the two events.

- ***Grey lines*** indicate missing or removed document objects.
- ***Red lines*** indicate document objects that have been changed between the two occasions. Double-clicking on the red lines will display a gap dialog indicating the differences between the two object revisions in detail.
- ***Green lines*** indicate added document objects.

3.17. Displaying Inconsistencies

Inconsistencies are in Aligned Element gaps, incompatibilities or contradictions in your project according to a set of defined but customizable rules called Validation rules (for help on configuring see Configuring Validation Rules).

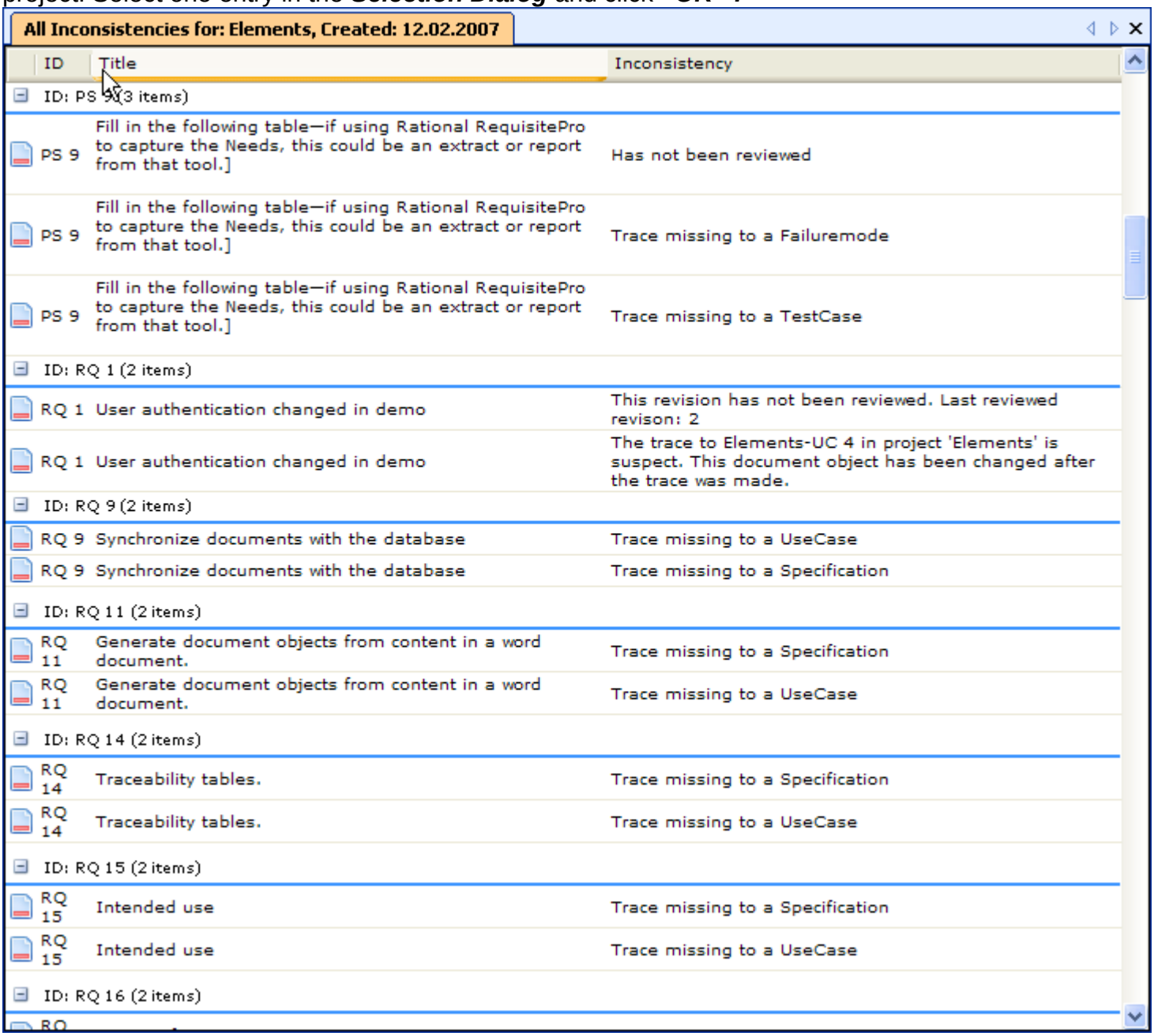
The following validation rules are applicable to the different document object types:

- Trace missing (e.g. a requirement should at least have a trace to one Specification)
- Risk is not mitigated (i.e. too high NRPN (risk) after mitigation (or mitigation missing))
- Severity is not mitigated (i.e. too high severity after mitigations)
- A document object has not been reviewed (or only in a previous revision)
- A document object has an open issue.
- A document object contains an attribute whose value is not as predefined, e.g. an executed test case has the Result = Failed.
- A trace is set suspect if the parent document object tracing to another object is changed after the trace to the child object is created.
- Document Object is not included in any file document object
- A file document object contains document objects that are not up-to-date
- The document object has a date attribute whose value is overdue
- A document object has a signature that is not closed
- A DHF Line Item defines a delivery that is not fulfilled.
- A DHF Line Item has a current status that does not match the “Status per Phase” definition setup for the document.
- Illegal traces i.e. an object has a trace to an objects of a type that is formally not making sense.
- Has Consistent Classification, can be applied to Software Items with a classification attribute (i.e. A ,B ,C) and checks if the severity on a Harm traced via Risk Analysis and Cause match the current classification. Tracing to a No Cause is a way to justify Safety Classification ‘A’.

If a validation rule criteria is not met this is listed under the objects inconsistencies.

The inconsistencies are always updated when a project is loaded at start. Most of the inconsistencies are also updated directly after each commit of an object or trace change. You can also refresh the inconsistency states by clicking ***Project -> Refresh Project*** to force an update.

You can also request a complete list of all current inconsistencies from the menu ***Inspect -> Display All Inconsistencies***. Here you have a possibility to select either a snapshot or the current project. Select one entry in the ***Selection Dialog*** and click ***<OK >.***



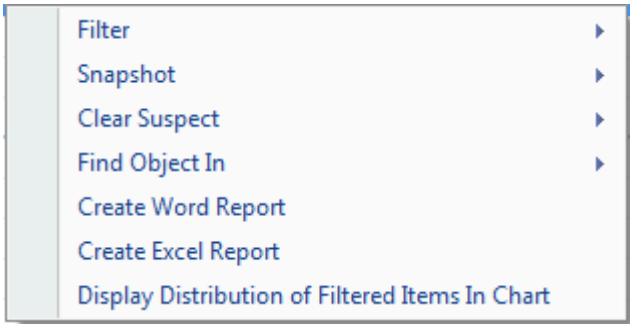
ID	Title	Inconsistency
ID: PS 9 (3 items)		
PS 9	Fill in the following table—if using Rational RequisitePro to capture the Needs, this could be an extract or report from that tool.]	Has not been reviewed
PS 9	Fill in the following table—if using Rational RequisitePro to capture the Needs, this could be an extract or report from that tool.]	Trace missing to a Failuremode
PS 9	Fill in the following table—if using Rational RequisitePro to capture the Needs, this could be an extract or report from that tool.]	Trace missing to a TestCase
ID: RQ 1 (2 items)		
RQ 1	User authentication changed in demo	This revision has not been reviewed. Last reviewed revison: 2
RQ 1	User authentication changed in demo	The trace to Elements-UC 4 in project 'Elements' is suspect. This document object has been changed after the trace was made.
ID: RQ 9 (2 items)		
RQ 9	Synchronize documents with the database	Trace missing to a UseCase
RQ 9	Synchronize documents with the database	Trace missing to a Specification
ID: RQ 11 (2 items)		
RQ 11	Generate document objects from content in a word document.	Trace missing to a Specification
RQ 11	Generate document objects from content in a word document.	Trace missing to a UseCase
ID: RQ 14 (2 items)		
RQ 14	Traceability tables.	Trace missing to a Specification
RQ 14	Traceability tables.	Trace missing to a UseCase
ID: RQ 15 (2 items)		
RQ 15	Intended use	Trace missing to a Specification
RQ 15	Intended use	Trace missing to a UseCase
ID: RQ 16 (2 items)		

All inconsistencies for the current project state displayed

You are able to sort the content of this view by clicking on the column headers.

To view a document object in a Document Object Form, simply double click on an inconsistency.

Use the context menu for the following functions:



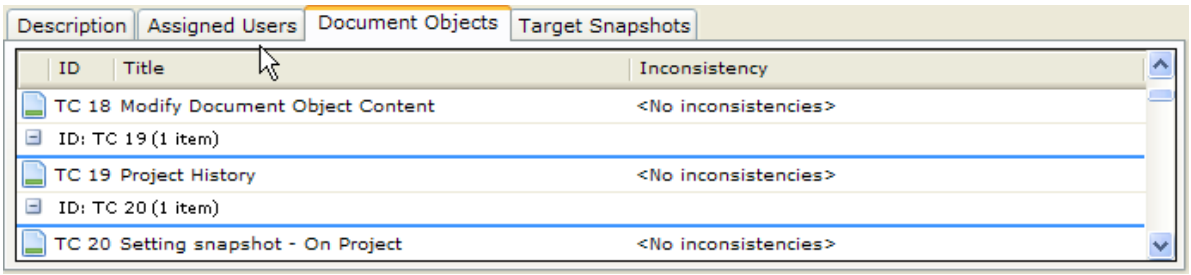
- ***Filter*** out the validation rules that interest you.
- Take a ***Snapshot*** of the selected Objects.
- ***Clear Suspect*** traces on selected Objects.
- ***Find Object*** in the Project, Trace or File Explorer.
- ***Create a Word Report*** of the selected Document Objects.
- ***Create an Excel Report*** of the selected Document Objects.
- ***Display the inconsistency distribution*** i.e. Document Objects that are inconsistent vis a vis Document Objects that are not inconsistent in the originally selected set.

Note! If the Display Inconsistencies form is empty, then either:

- *The selected object have currently no inconsistencies or*
- *The Filters for the inconsistencies are not switched on*

The ***Inconsistency View*** also has drag support for trace setting in other Explorers.

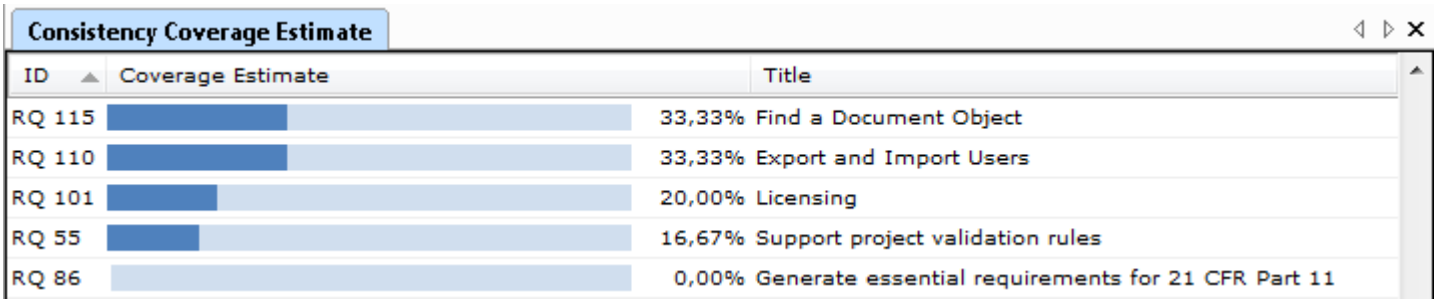
In a review, the inconsistencies that apply to the identified review input (the snapshots that are added to the review) are listed in the Document form to help the review participants.



Inconsistencies in a Review Document Form

3.18. Displaying Consistency Coverage

In conjunction with the inconsistency concept, Aligned Elements also support the option of displaying the ***Consistency Coverage*** of a selected Document Object set. The Consistency Coverage indicates to which degree a Document Object is consistent in terms of percent. If a Document Object does not have any inconsistencies, then its Consistency Coverage is 100%.



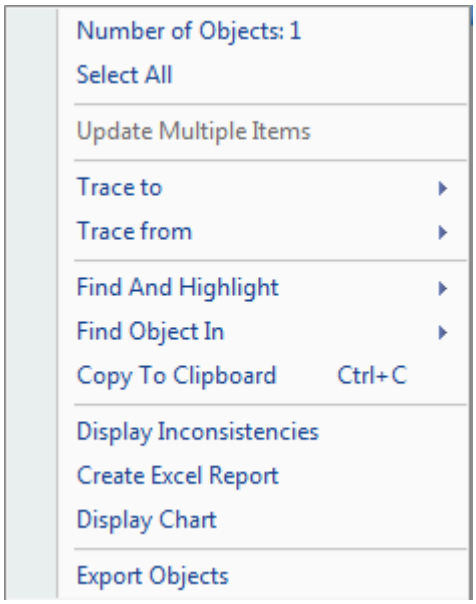
Note! Hover with the mouse over a line item to access the tool tip containing all open inconsistencies for the selected Document Object.

The ***Consistency Coverage Estimation View*** can be displayed on a selected Document Object subset from:

- The ***Project Explorer***
- The ***Query Output List***
- The ***Inspect*** Main Menu Item

A number of functions are available using the context menu.

- ***The Number of Objects*** that meet the filter conditions.
- ***Select all*** objects displayed in the list.
- ***Update Multiple Items*** in batch mode.
- ***Set Traces To / From*** the selected objects
- ***Find And Highlight*** a particular word in the output list.
- Find the Document Object in a ***Project Explorer, Trace Explorer or File Explorer***.
- ***Copy*** the selected objects to the clipboard for offline editing.



- ***Display Inconsistencies*** on the selected Document Objects.
- ***Create Excel Report*** to create an Excel file of the Document Objects in the Output Set.
- ***Display Chart*** generates a breakdown chart for the selected objects.
- ***Export*** the selected Document Objects

The view also has drag-support for setting traces in other Explorers.

The Coverage idea is based on a granting “points” for not having inconsistencies. Depending on the current state of the Document Object, it is awarded “potential” inconsistency points and “actual” consistency points. Subtracting the “actual” coverage points from the “potential” inconsistency points, causes a “deficit”.

The coverage is then calculated as actual points divided by potential points.

The potential inconsistency points are calculated by inspecting the Validation Rules for the type and comparing it with its current state. Some of the Validation rules are concerned with the Document Objects internal state, other are concerned with the state of the Document Objects traces.

Validation Rule	Deficit
Missing Trace	+ 1 if there is no trace of the specified type.
Illegal Trace	+ 1 if at least one trace is of illegal Document Object Type
Not Reviewed	+ 1 if the most current revision of the Document Object has not been reviewed.
Attribute State	+ 1 if the current attribute state is not expected.
Suspect Trace	+ 1 per suspect trace.
Open Issue	+ 1 per open issue
Risk/Harm Not Mitigated	+ 1 per traced and insufficiently mitigated hazards / harms.
Object Not In File	+ 1 if most current revision of object is not in a Word document.
Date Overdue	+ 1 is the date is overdue.
Objects in File Up to date	+ 1 if any of the Document Objects in the document is of most current revision.
Open Signature	+ 1 per associated open signatures.

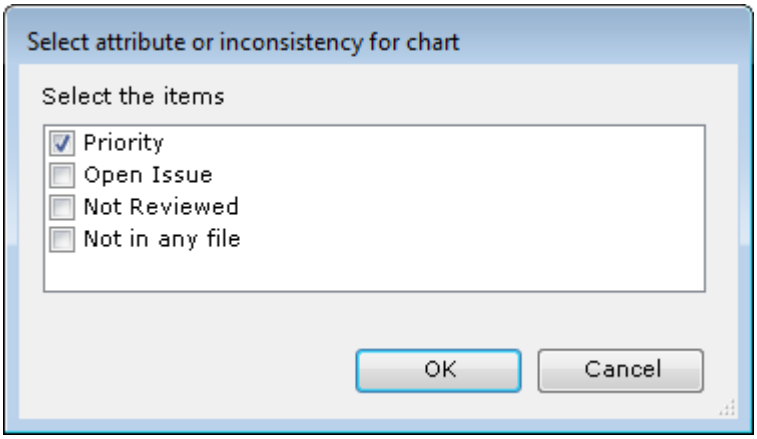
Note: The Consistency Coverage view only evaluates and displays the inconsistencies activated in the Inconsistency View filter.

Validation rules can be explicitly exempted from the coverage calculation in the Document Object templates. The consistency coverage can also be subjected to a weight factor in the Document Object Template, making some inconsistencies having a greater or smaller effect on the total coverage calculation. For exact notation, see 6.7.3.

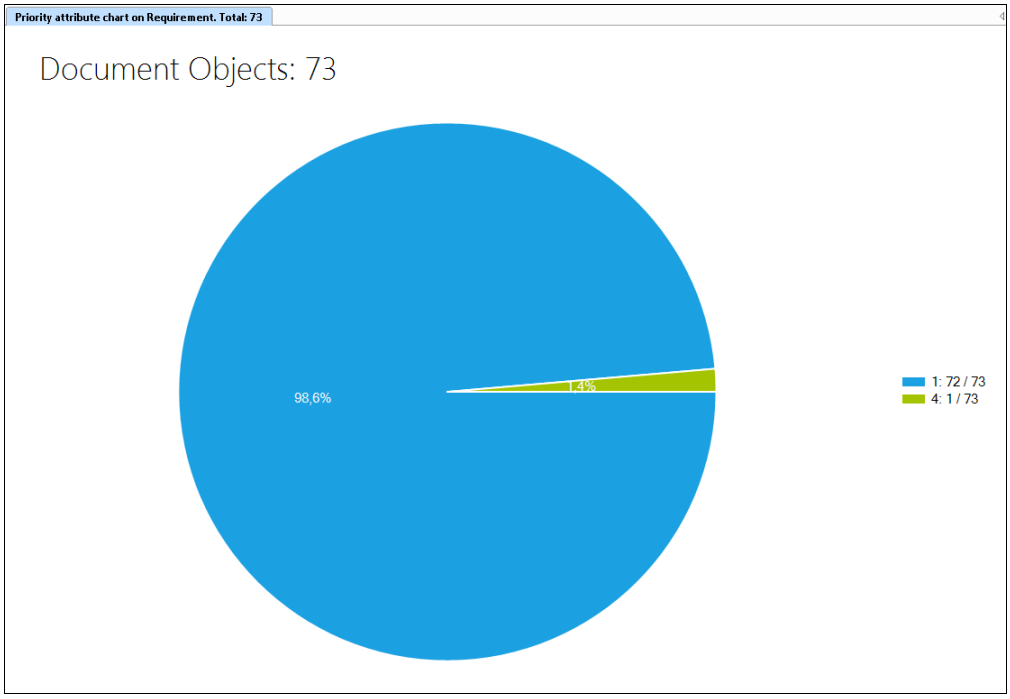
3.19. Displaying Charts

Aligned Elements can display breakdown charts on a selected set of Document Objects, either by using the context menu in applicable Views and Explorers or from the Main Menu item ***Inspect***.

When a set of Document Objects of a Single Document Object type is selected, the user is prompted to select along which dimension the breakdown shall be perform. The user can select an attribute (if it is of Enum, UserEnum, Boolean or IntegerRange) or an inconsistency type as breakdown parameter.

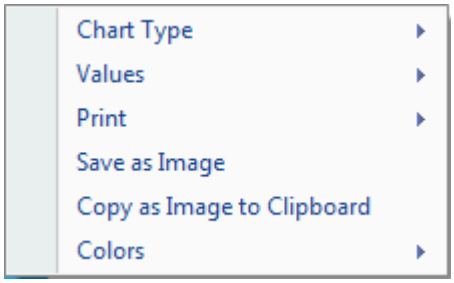


After selecting the breakdown parameter a chart is displayed:



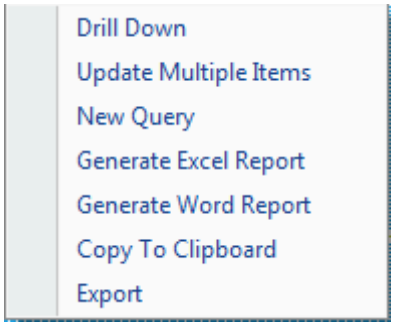
The chapter caption indicates the total number of Document Objects in the input set. The legend on the right hand side indicates details on the distribution of the selected parameter.

If right-clicking on the white area around the chart, a context menu with the following options is displayed:



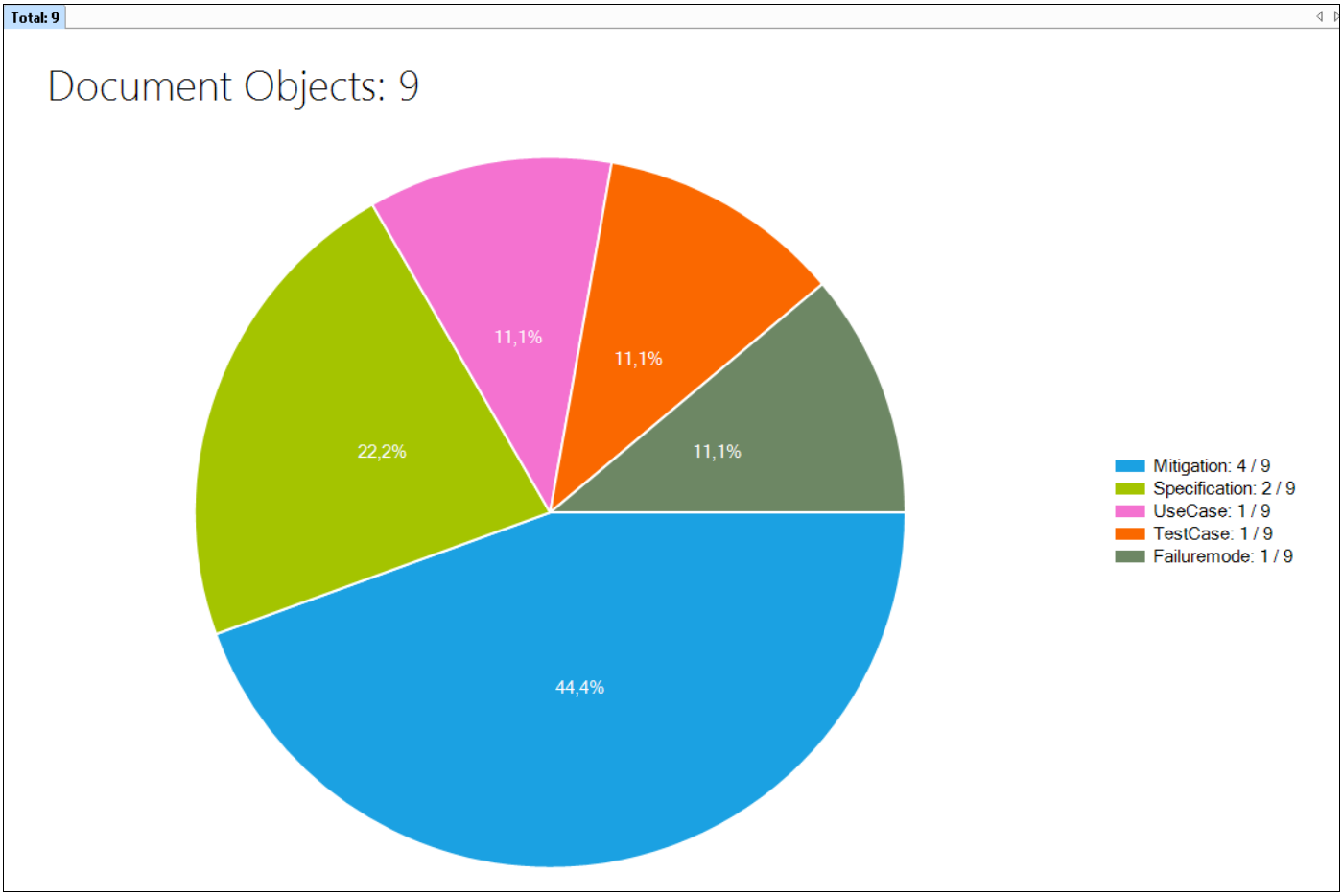
- Chart type – Display the chart as pie chart of bar chart
- Values – Display the values as absolute or percentage values
- Print – Use Print Preview, Page Setup and Print to print the chart
- Save as Image – Save the chart as image file to disk.
- Save as Image to Clipboard – Copy the chart as image to the clipboard
- Colors – Set the chart colors to Office 2007 style or Metro style

When selecting a chart component (a bar or a pie slice), a different context menu appears with the following functions operating on the selected Document Object set:



- Drill down – Display a subsequent breakdown chart with the chart component as input set.
- Update Multiple Items – Set a new attribute value for a selected attribute on the Document Object set.
- New Query – Create a new query with the chart component as input set.
- Generate Word/Excel Report – Generates reports of the selected Document Object Set.
- Copy to Clipboard - Copy the selected Document Object set to the clipboard as semicolon separated strings
- Export – Export the selected Document Object set

Note: if the chart is displayed with an input set consisting of different Document Object type, the break down is done on Document Object Type. See below.


Total: 9
Document Objects: 9
11,1%
11,1%
22,2%
11,1%
44,4%
Mitigation: 4 / 9
Specification: 2 / 9
UseCase: 1 / 9
TestCase: 1 / 9
Failuremode: 1 / 9

3.20. Work with the DHF Index

A Design History File Index is a controller index stating which deliveries that makes up the Design History File. It includes information like the title, version and location of each delivery. Furthermore, it is common that the company Quality Management System (QMS) defines required delivery state at specific project phases. For example, the QMS might require that the DHF contains a "Product Requirements Document" and that this delivery must be available as draft at Milestone 2 but released at Milestone 3.

Normally, the QMS provides a DHF Index Document Template, that specifies:

- The Deliveries of the DHF (e.g. Product Requirement Document, Master Test Plan, Risk Management Plan).
- At which Project Phase each Delivery must be available in which state. (e.g. PRD must exist as (at least) draft at M2 but must be released at M3)

The Project then fills out this template with the concrete deliveries.

The Aligned Elements DHF Index has been built to reflect this behavior.
Note: This feature requires that a DHF Line Item template exists for your project.

From Aligned Elements V1.6 the following 4 new features make up the DHF Index:

1. The Project Phase declaration in the Project Settings (see Project Settings).
2. The new Document Object type "DHF Line Item".
3. Two new Inconsistency rules for the type "DHF Line Item" which checks:
    a. That a DHF Line Item is "fulfilled" by a concrete delivery.
    b. That the delivery state is valid for the given project phase.
4. A DHF Index Table which summarizes the DHF Line Items.

Your different project deliveries are displayed as DHF Line Items in the ***Project Explorer***. These can be used to create your required project documentation and check the consistency and state of your project at the current time.

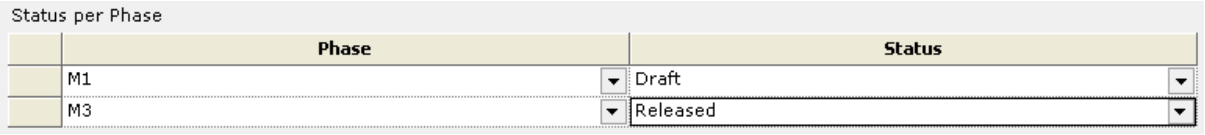
3.20.1. Setting up DHF Line Items according to your Quality Management System

1. In the ***Project Explorer***, use the context menu to create a DHF Line Item. In the title of the DHF Line Item, write the name of the Delivery (e.g. Product Requirement Document or Risk Management Plan).

    A DHF Line Item is a Document Object and therefore can be used as all other Document Object Types i.e. traced, updated, checked for inconsistencies etc. Just like for any other Document Object you can use Chapters to group your objects.

We recommend that you use the top level Chapters to group which DHF Line Items that belong to which Project Phase. This grouping will later be displayed in the DHF Index.

2. Define the required status of the document object according to the QMS. In the “Status Per Phase” data grid, specify the required status of the document in each phase according to your QMS. Use the Context menu it add rows.



Note!

- *It is not unlikely that your QMS have additional/other attributes or attribute values than the ones specified in the default DHF Line Item template e.g. the name of the statuses available in the Status to Phase data grid. Please contact us if you want help to modify your DHF Line Item template to fit your QMS.*
- *The control assumes that the entered status is applicable for all phases up to entered phase.*

  For example, if you enter only one row with the Phase ***“M3”*** and the Status ***“Draft”*** it is implied that ***“Draft”*** is the only valid state for all the phases ***“M1”, “M2”*** and ***“M3”*** but *not* for ***“M4”*.**

  Consequently, if you enter only one row with the Phase ***“M3”*** and the Status ***“Release”*** it is implied that ***“Release”*** is the only valid state for all the phases ***“M1”, “M2”*** and ***“M3”.***

  This can be somewhat confusing. Therefore, you should always enter at least two rows in this table with adjacent phases. In the case above, the correct way is to enter one row with Phase *“M2”* Status *“Draft”* and a second row with Phase *“M3”* Status *“Release”.*

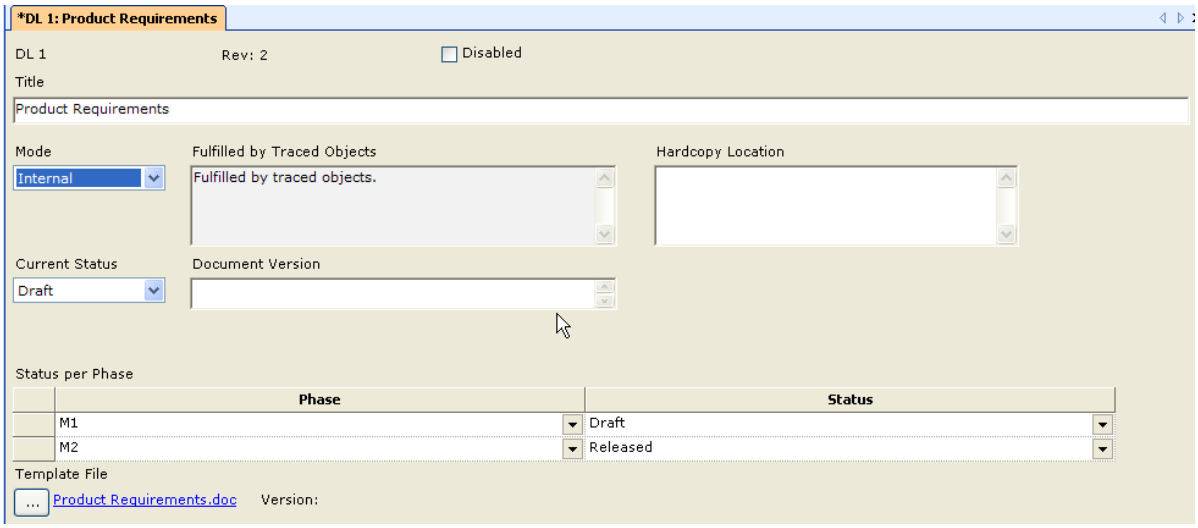
3. If you have a Document (Word) Template for the Delivery (e.g. a Product Requirement Document template) you can add it using the ***Template File Attribute***.

3.20.2. Connect DHF Line Items to your Project Deliveries

Up until now we have defined what the Design History File should contain, i.e. which deliveries that must be included and the "status to phase" rules according to the QMS.

The next step is to define what the Design History File actually contains at this given point in time.

A DHF Line Item may point to documentation within Aligned Elements (***Internal mode***) or to documents stored outside Aligned Elements (***External mode***). The applicability is defined in the attribute Mode.



3.20.3. External Mode

If the mode is set to External, you shall specify the name of the concrete delivery that fulfills this required delivery. This is done in the attribute "Fulfilled by External References".
If this attribute is empty, the DHF Line Item is considered inconsistent.

The “Document Version” and the “Current Status” of the document must be set manually using the available Status and Version attributes.

3.20.4. Internal Mode

For the Internal mode, normal traces define which document objects that fulfill the delivery. You may use one DHF line Item and trace to any number of document objects.

If no trace is set, the DHF Line Item is considered inconsistent.

If the File Object has a status attribute, then this status overrides the “Current Status” attribute in the DHF Line Item. The mapping of statuses can be done in the DHFStateToPhase validation rule.

If the File Object has a version, then this version overrides the “Document Version” attribute in the DHF Line Item.

3.20.5. N/A mode

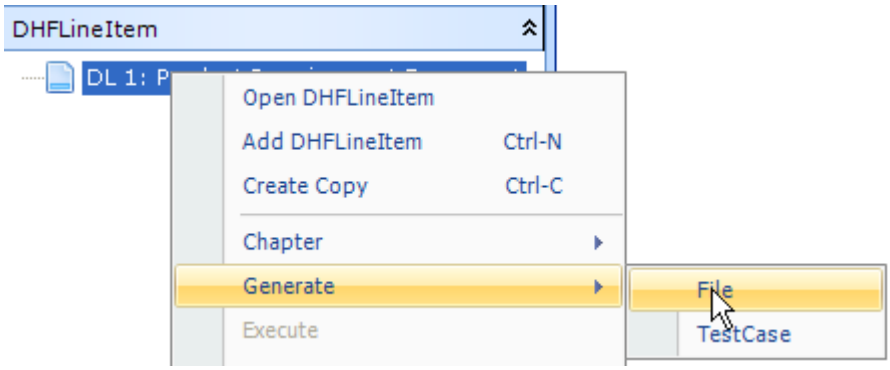
Your project might not apply all documents defines by the QMS. For example, the QMS might require a document called "Electrical Wiring Plan". If you are working on a software project it does not make sense to include this document. In such a case you can set the mode to N/A ("Not Applicable") to explicitly declare that you intend to skip this document in your DHF. You are required to write a qualified reason in the attribute "Qualification for N/A" for a N/A item to be consistent.

The following convention should be used:

- For DHF Line Items in internal mode, you may use one DHF line Item and trace to any number of document objects.
- For DHF Line Items in external mode, you should create one DHF Line Item for each external document to be able to track the individual version and status of the document.

To create a new file based on a DHF Line item:

1. Select the applicable DHF Line Item and Generate a File Object for the item:



2. A file document object is created based on the template as defined in the DHF line item.
3. Open the file and add the applicable content (in our case product Requirements)

To track external documentation in Aligned Elements:

1. Open the applicable DHF Line Item (or create a copy of an existing DHF Line Item) and set the mode to External. Type the name of the document in the attribute Fulfilled by external References and the file path in Hardcopy Location.

3.20.6. Display DHF Index

To view the complete Design History File Index for a project, select the menu item ***Inspect -> Display DHF Index.***

A selection dialog is displayed where you can choose between the current project or any snapshots in your project. Make a selection and press ***<OK >.***

DHF Index, Current Phase:

ID	Title	Fulfilled by	Hardcopy Location	Mode	Current Status	Document Version	Status per Phase
Chapter: Root (4 items)							
DL 1	Product Requirements	FI 5: Product Requirement I		Internal	FI 5: Draft		M1: Draft M2: Released
DL 2	SW Specifications	FI 6: SW Specifications Module I FI 7: SW Specifications Module II FI 8: SW Specifications Module III		Internal	FI 6: Draft FI 7: Draft FI 8: Draft		M3: Draft M4: Released
DL 3	Test Plans	FI 9: Test Plan Module I FI 10: Test Plan Module II		Internal	FI 9: Draft FI 10: Draft		M3: Draft M4: Released
DL 4	Module Drawings			External	Draft		M3: Draft M4: Released

DHF Index for a project

Each column represents an attribute in the DHF Line Item. The columns can be rearranged and their visibility can be switched on and off using the context menu.

It is also possible to use the context menu to set snapshots, display inconsistencies and print a report.

Note! The DHF Index can be inserted in a word document using the "Insert DHF Index" button in the Word Project Explorer. It will then be displayed with the columns and column order defined in the Display DHF Index grid.

Just like for any other Document Object type, the DHFLineItem template can be modified to accommodate for additional attributes. However, uniquely for the DHFLineItem type there exist a number of additional hardcoded attribute names that evaluates the corresponding of the traced items (used for internal mode). These attribute names are:

- **Creator**
  In external mode, full name (if available, otherwise username) of user that created first revision of the DHFLineItem
  In internal mode, full name (if available, otherwise username) of user that created first revision of the traced object(s).

- **Created**
  In external mode, date of creation (of first revision) of the DHFLineItem
  In internal mode, date of creation (of first revision) of the traced object(s).

- **LastModifier**
  In external mode, full name (if available, otherwise username) of user that created last revision of the DHFLineItem
  In internal mode, full name (if available, otherwise username) of user that created last revision of the traced object(s).

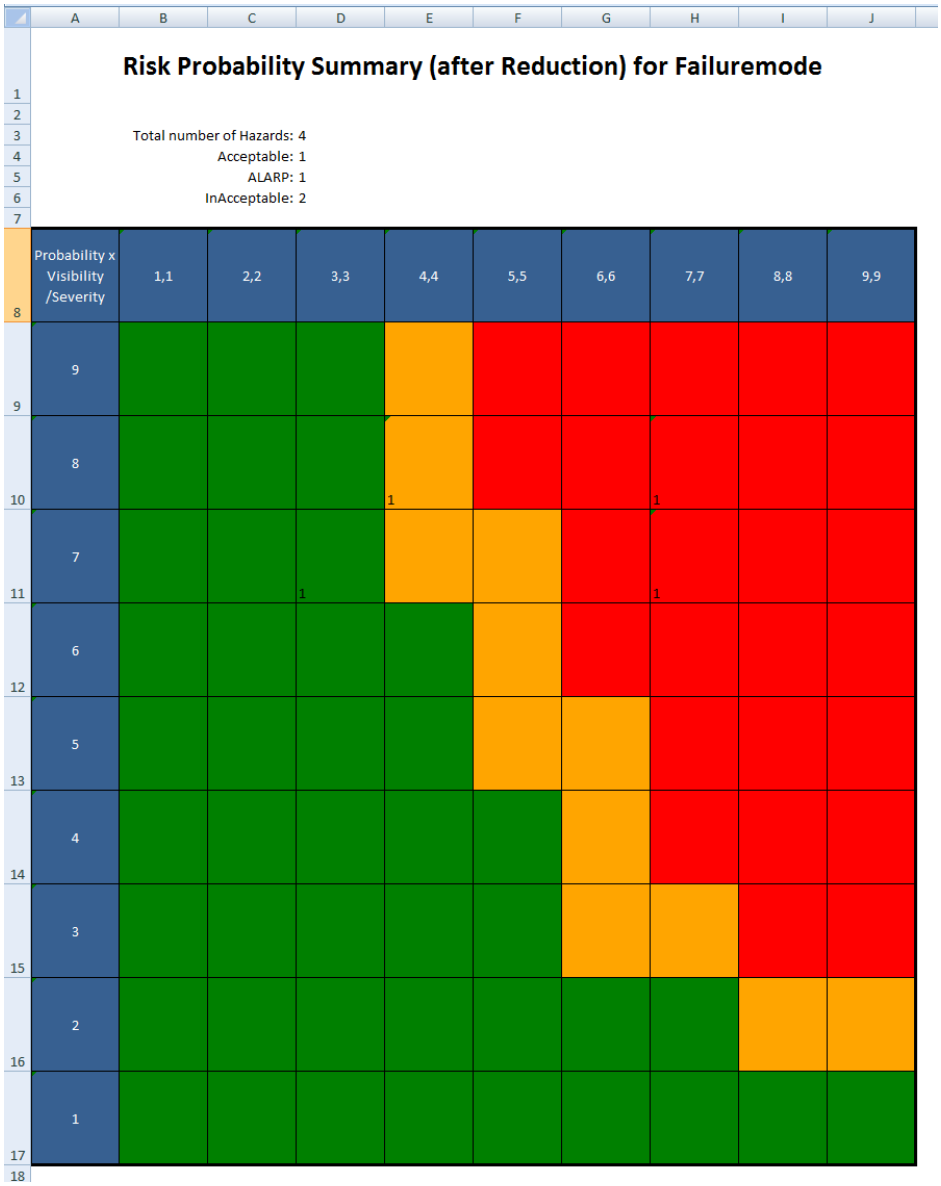
- **LastModified**
  In external mode, date of last modification (creation of last revision) of the DHFLineItem.
  In internal mode, date of last modification (creation of last revision) of the traced object(s).

3.21. Display or Insert the Risk Summary

The Risk Summary Excel Report provides an overview of all hazards /probability of harms before and after mitigations in the project.

Optionally, the Risk Summary may be based on a query. The query Document Object type must be the applicable risk document object type, e.g. a Failure-mode or Risk Analysis.

The Risk Summary Excel report may be generated from the Inspect Menu and is defined like this:



Risk Probability Summary (after Reduction) for Failuremode

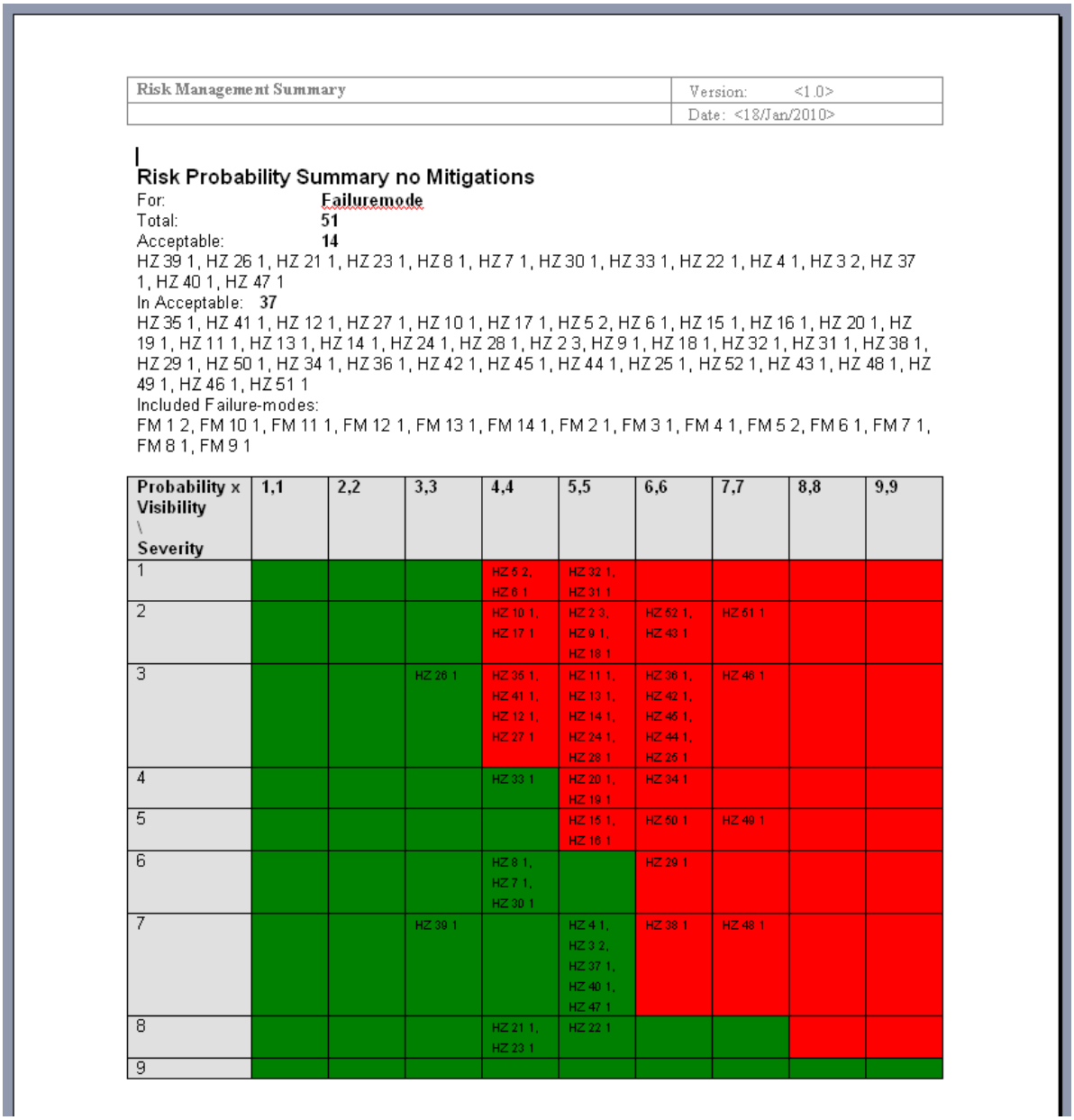
Total number of Hazards: 4
Acceptable: 1
ALARP: 1
InAcceptable: 2

Probability x Visibility /Severity	1,1	2,2	3,3	4,4	5,5	6,6	7,7	8,8	9,9
9									
8				1			1		
7			1				1		
6									
5									
4									
3									
2									
1									

The Report displays the number of hazards / probability of harms in the 3 regions Acceptable (Green), ALARP (As Low As Reasonably Possible, Orange)/ALAP(As Low As Possible) and In Acceptable (Red). In the example above the region ALARP/ALAP is not used.

If the configuration for the RPN Table has not yet been made in the project templates, the report cannot be displayed. To configure e.g. a Failure-mode to display a Risk Summary see 6.7.4.

The Risk Summary can also be inserted into a Word document from the Toolbar in Word.
The result can look like this, depending on the used template:



Risk Management Summary	Version: <1.0>
	Date: <18/Jan/2010>

Risk Probability Summary no Mitigations

For: **Failuremode**
Total: **51**
Acceptable: **14**
HZ 39 1, HZ 26 1, HZ 21 1, HZ 23 1, HZ 8 1, HZ 7 1, HZ 30 1, HZ 33 1, HZ 22 1, HZ 4 1, HZ 3 2, HZ 37 1, HZ 40 1, HZ 47 1
In Acceptable: **37**
HZ 35 1, HZ 41 1, HZ 12 1, HZ 27 1, HZ 10 1, HZ 17 1, HZ 5 2, HZ 6 1, HZ 15 1, HZ 16 1, HZ 20 1, HZ 19 1, HZ 11 1, HZ 13 1, HZ 14 1, HZ 24 1, HZ 28 1, HZ 2 3, HZ 9 1, HZ 18 1, HZ 32 1, HZ 31 1, HZ 38 1, HZ 29 1, HZ 50 1, HZ 34 1, HZ 36 1, HZ 42 1, HZ 45 1, HZ 44 1, HZ 25 1, HZ 52 1, HZ 43 1, HZ 48 1, HZ 49 1, HZ 46 1, HZ 51 1
Included Failure-modes:
FM 1 2, FM 10 1, FM 11 1, FM 12 1, FM 13 1, FM 14 1, FM 2 1, FM 3 1, FM 4 1, FM 5 2, FM 6 1, FM 7 1, FM 8 1, FM 9 1

Probability x Visibility \ Severity	1,1	2,2	3,3	4,4	5,5	6,6	7,7	8,8	9,9
1				HZ 5 2, HZ 6 1	HZ 32 1, HZ 31 1				
2				HZ 10 1, HZ 17 1	HZ 2 3, HZ 9 1, HZ 18 1	HZ 52 1, HZ 43 1	HZ 51 1		
3			HZ 26 1	HZ 35 1, HZ 41 1, HZ 12 1, HZ 27 1	HZ 11 1, HZ 13 1, HZ 14 1, HZ 24 1, HZ 28 1	HZ 36 1, HZ 42 1, HZ 45 1, HZ 44 1, HZ 25 1	HZ 46 1		
4				HZ 33 1	HZ 20 1, HZ 19 1	HZ 34 1			
5					HZ 15 1, HZ 16 1	HZ 50 1	HZ 49 1		
6				HZ 8 1, HZ 7 1, HZ 30 1		HZ 29 1			
7			HZ 39 1		HZ 4 1, HZ 3 2, HZ 37 1, HZ 40 1, HZ 47 1	HZ 38 1	HZ 48 1		
8				HZ 21 1, HZ 23 1	HZ 22 1				
9									

Risk Summary in Word

Note!
In the case when 3 parameters for risk calculation are used (e.g. severity, probability and visibility), an approximation is done to allow the display in a table. Two factors (typically probability and visibility) are combined on one axis. The display of the severity and risk region (i.e. color) will always be correct but the absolute value of the probability and visibility may not match the description on the axis and is approximated to the nearest possible cell in the table.

3.22. Clearing Suspect Traces

It is fairly obvious that modifying an existing Document Objects might have an impact on objects traced to it. E.g. if I make a change in a specification, it is likely that I have to update the Test Cases that test the specification accordingly.

Aligned Elements therefore implements an inconsistency rule called “SuspectTrace”. This implies that when a Document Object that has outgoing traces is modified, the traces are marked as “Suspect”.

In Elements this manifests in different ways:

- The object that was modified gets an suspect inconsistency
- In the Trace Explorer the objects traced from the modified object are marked with a special icon 

The Suspect state can be relieved/removed in two ways:

- Update all objects traced from the modified object.
- Remove all the traces from the modified object.
- The user manually removes the Suspect state using one of the following alternatives:
- Clicking “Clear Suspect” in the Trace Explorer on the modified Document Object.
- Clicking “Clear Suspect” in the Display Inconsistency View on the modified Document Object.

Note!

- *Both the parent and child Document Object Type must have the suspect trace rule implemented for the suspect trace inconsistency to show up.*
- *It is possible to disable the behavior of automatic clearance of the suspect state by updating the traced objects in the Project Settings.*

It is a fact that the vast majority of changes made to Design History File Items do not have an impact on traced objects since most changes are trivial e.g. correcting spelling or format. It is possible to override the setting of the suspect state by ticking the ***“Suppress Suspect”*** check box in the Gap Form. Read more about this at 0.

3.23. Export Document Objects

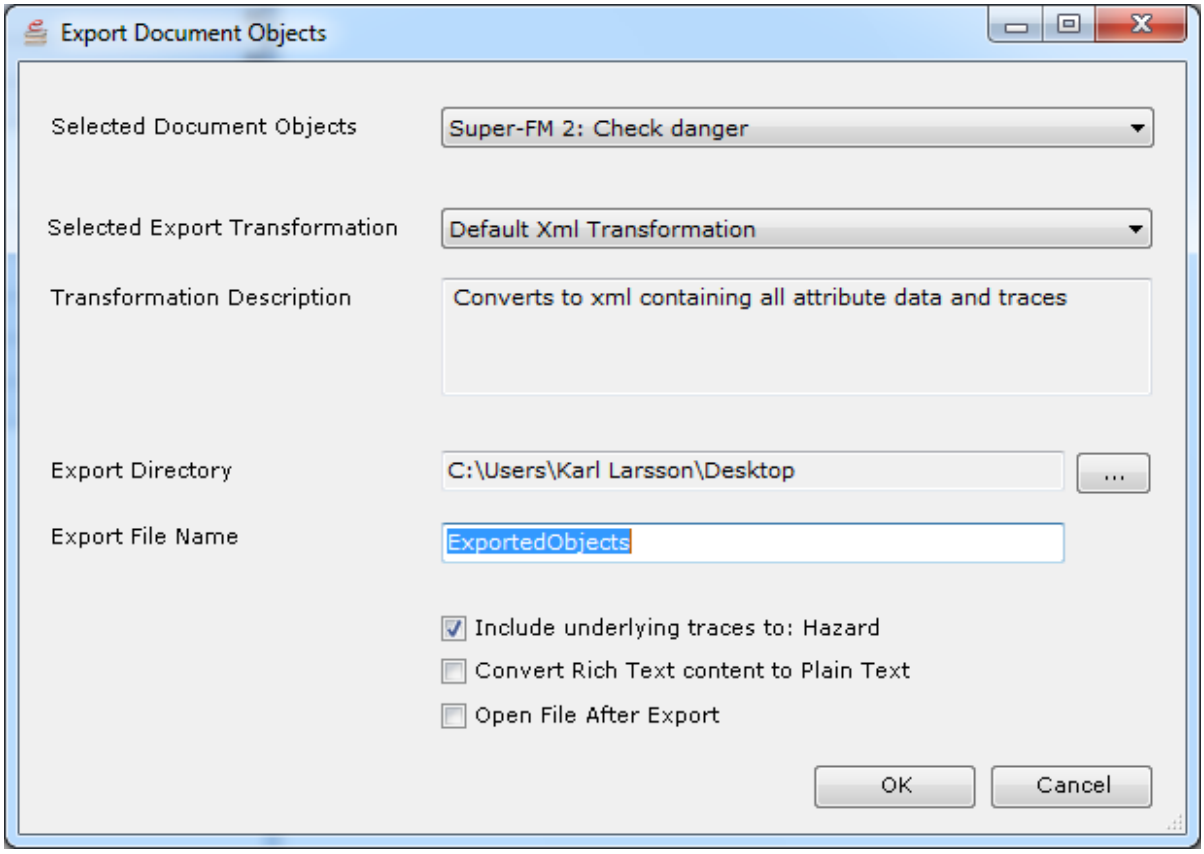
It is possible to export document object to external files. This functionality is available in the Project Explorer, the Trace Explorer and the Issue View.

The exported data includes:

- General Document Object data such as type, ID, revision, chapter and title
- Attribute data
- IDs of incoming and outgoing traces
- Revision information

To export Document Objects:

1. Select the document objects in the applicable View
2. Click ***<Export Objects>*** in the context menu.
3. In the Export dialog you have the following options:



- **Select Export Transformation**
  The exported document objects are treated by a (selected) xsl transformation file which converts the object to the applicable format. The following xsl transformation files are delivered with the default templates:

  - Default Xml Transformation
  - A CSV Transformation

  - An Excel Transformation
  - A HTML Transformation
  - An MS Outlook Transformation

- **Export Directory**
  The directory where the export file is stored.

- **Export File Name**
  The name of the file (not including the file extension which is defined in the transformation file.)

- **Include underlying traces to**
  When exporting Failuremode-like objects, the user is inquired if the traced Hazard and Mitigation objects should automatically be included in the exported set. Since Failuremode-like objects are closely tied to the traced Hazard objects, it is recommended to include these during export.

- **Convert Rich Text content to Plain Text**
  Converts the content of all Rich Text attributes to plain text.

- **Open File after export**
  Opens the exported file when the export is completed using the default application for the file extension of the exported file.

For document object types that contain FileAttributes (such as Attachments), a copy of the file associated with the file attribute is placed in a new folder (placed in the target export directory) with the same name as the ID of the document object.

Note! It is possible to define a document object to not be importable. An example of such an object is the File Object. Since a File Object can contain a Word Document that might contain document objects from a different project, synchronization of a Word Document from such an imported File Object might cause damage through ID confusion. Therefore, File Objects are defined as non importable in the rvt template file by setting the "TypeInfo" attribute ImportableDocObjType="false".

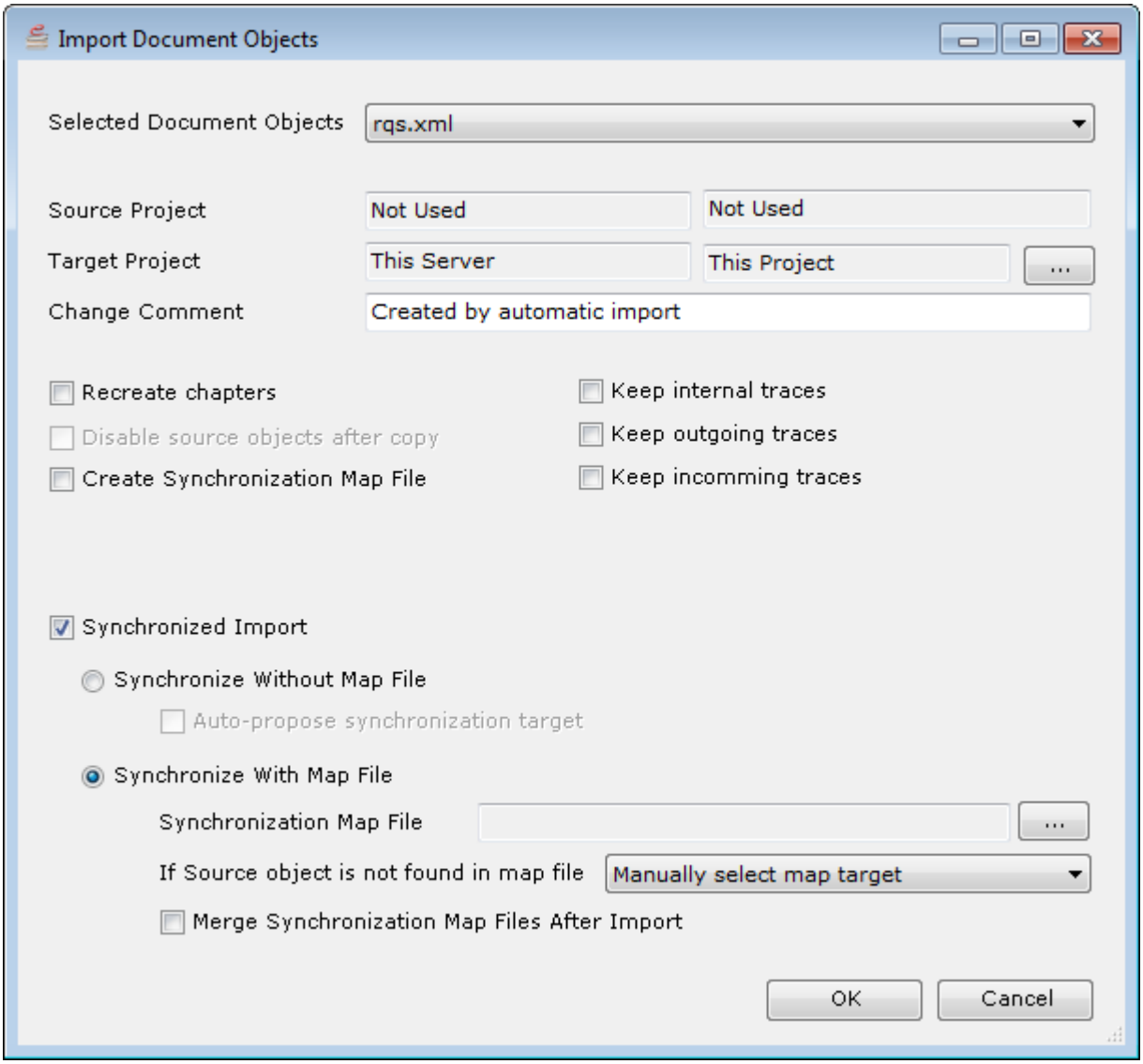
Note! The Default XML Export contains the Aligned Elements version number to indicate which version was used for the export.

3.24. Import Document Objects

It is possible to import Document Object from files exported using the default xml Transformation as described in 3.23 or manually/externally created. Importing Document Objects is only possible from the ***Project Explorer***.

To import Document Objects:

1. Select the target chapter or book in the Project Explorer.
2. Click ***Import Objects*** in the context menu.
3. You will now be prompted to select the files to import. The Directory Browser is set to display xml files. Note that you can import several files at a time.
4. The Import Dialog will now be displayed. The top drop down box contains the objects that have been selected for Document Objects to copy. The following options are available:



- **Change Comment**
  You can here customize the initial change comment (set for revision 1) used when the objects are created e.g. “Imported from internal system so-and-so”.

- **Recreate chapters**
  By default, exported Document Objects also contain their original chapter path. With this option selected, the chapter path is recreated (if it does not already exists) and the imported object is automatically placed in that chapter.

- **Incoming, Internal and Outgoing Traces**
  Trace information are also, by default, included in the export object description and traces can be recreated if the options are selected. “Internal traces” signifies traces that exist between the imported objects. Outgoing traces are traces from the imported objects to other objects. Incoming traces are traces from other objects to the imported objects.

Note!
- *When setting Internal Traces, only the “outgoing” traces in the import file is considered.*
- *Traces are only recreated if the ID **AND** revision matches.*
- *For outgoing and incoming traces to be set, these objects must be loaded and available at the time of import.*

The following rules apply to importing:

- Document Objects of the same type as the target chapter will be placed in the target chapter. Document Objects of different types are placed in the applicable book (under the root chapter).

- Xml Files that do not contain Document Object information will be discarded.

- The Document Objects will receive new IDs as they are imported.

- If a Document Object is imported several times, a copy with a new ID of the object is created each time.

Note! On exporting and importing Failure modes, it is recommended that the corresponding Hazards are exported and imported in the same operation, since the cause, effect, probability, severity and visibility information is stored in the Hazard. Use “Keep Internal Traces” at import.

- **Synchronized Import**
  Synchronized import implies that the data of an existing object is overwritten with the data of an imported object. Aligned Elements offer two modes of synchronized import:

Note! Only Document Object attribute data are synchronized, not traces. A new revision is created for the target Document Object when it is synchronized.

- **Without Synchronization Map File**
  For each imported object the user manually selects which existing objects that shall be overwritten.

For this option there is the additional option of ***Auto-proposition of the synch object***. If the imported object has an equivalent ID in the book of import, that object is automatically suggested as the object to synchronize with.

- **With Synchronization Map**
  A Synchronization Map is an xml file that contains ID-mapping information from previous import sessions. It is a key-value collection where:
  - The key is the ID of the object in the import file (i.e. from the exported object)
  - The value is the ID created for the object when imported

  It is assumed that these object IDs are contained in the imported files and the target project respectively.

  If the Synchronization is done regularly for the same objects set, this mode is clearly preferable.

  Consequentially, there also exists an option to “Create Synchronization Map File” at import.

  Synchronization with a Map file has the additional options for objects that are found in the import file but not found in Map file:

  - Import as normal – The object is simply imported as a new object.
  - Skip import of object – The object is NOT imported.
  - Manually select the map target – Prompts the user with the option to manually designate an object to overwrite with the imported data.

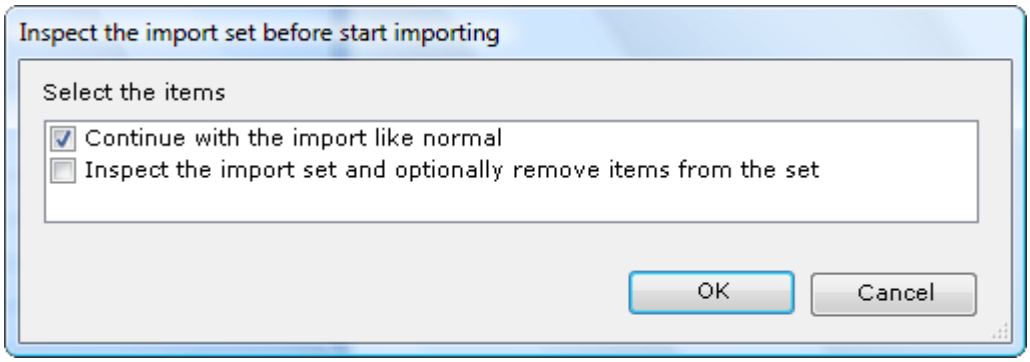
- **Merge Synchronization Map Files after Import**
  In the case where synchronized imports are done regularly and where new Document Objects are added to the import set, it can be of interest to update the synch map file with these new Document Objects using the “Merge Synchronization Map Files after Import”.

  This is done in the following manner:

  - Check the “Create Synchronization Map File” to generate the import map for the new Document Objects which shall be merged with the existing map files.
  - Load the Synch Map file(s) to be used during import for the existing mapping.
  - Check the “Merge Synchronization Map Files after Import”.

  As a result, the generated map file for the new Document Objects will be merged with the existing Synch Map files, creating a new, updated Synch Map file.

- **The Import Process**
  Regardless of the type of import, to start the import, click OK in the Import Dialog. Initially, the user also has the option to deselect Document Objects from the import file.



Selecting the second option takes you to a dialog where you can deselect Document Objects from the import set. The deselected objects are not imported.

3.24.1. Import mapping of unknown Object Types

If the imported Document Object is of a type that is not available in the target projects template directory, the user will be asked to map the unknown type to a known type (i.e. a type available in the template directory).

If the user selects to map to a valid, existing type, all subsequent objects of the unknown type found in the input session will automatically be mapped to the selected type.

If the user declines to map the object of the unknown type to an existing type, all subsequent objects of the unknown type found in the input session will be discarded / not imported.

3.24.2. Import mapping of unknown Attribute

If the imported Document Object contains an Attribute of a name and type that does not match an existing Attribute in the given Document Object Type, the user will be asked to map the unknown attribute to a known/existing attribute of the same attribute type.

If the user selects to map to a valid, existing attribute of the same attribute type, the attribute in all subsequent objects found in the input session will automatically be mapped to the selected attribute.

If the user declines to map the unknown attribute to an existing attribute type, the unknown attribute in all subsequent objects found in the input session will be discarded / not imported.

3.24.3. Import mapping of unknown Attribute Enum Value

If the imported Document Object contains an Enum or UserEnum Attribute Value that does not match an existing Attribute Value in the given Document Object Type, the user will be asked to map the unknown value to a known/existing value.

The user has to map the unknown attribute value to a valid, existing value and consequently the unknown attribute value in all subsequent objects found in the input session will automatically be mapped to the selected attribute value.

3.24.4. Applying xsl-transformations on the import file

If the import file is not conformant to the default import-xml schema, the user is inquired if an import transformation should be applied. If applicable, the user will be asked to supply a valid xsl-file defining the transformation.

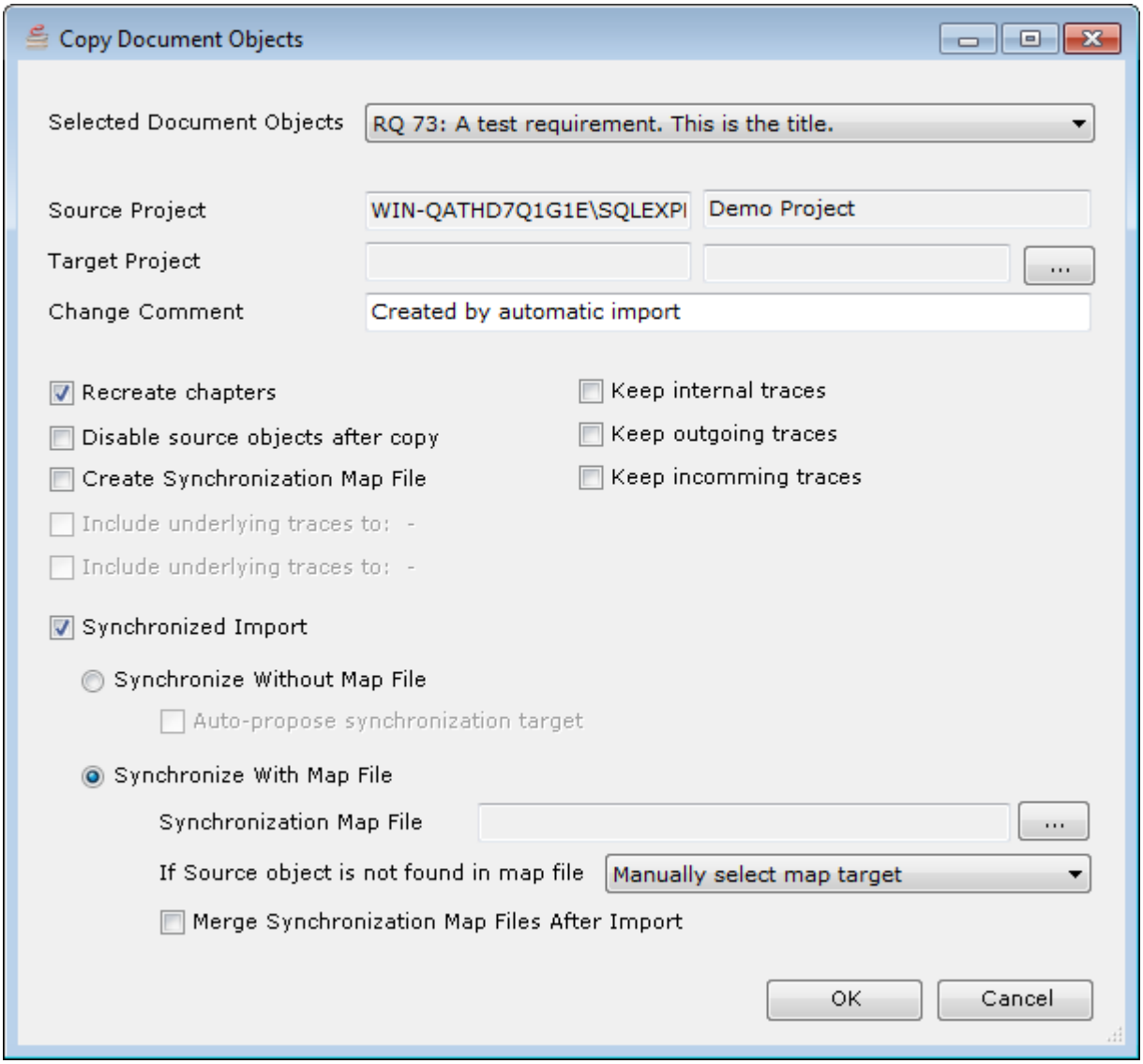
3.25. Copy Document Objects to a different Project

It is possible to Copy Document Objects from the current (source) project to a different (target) project. This mechanism is essentially only an automation of the existing export and import functions described in 3.23 and 3.24.

It is only possible to Copy Document Objects from the ***Project Explorer*** context menu.

To copy Document Objects to a different project:

1. Select the document objects in the ***Project Explorer***.
2. Click ***Copy Objects to Project*** in the context menu.
3. You will now be prompted with the following dialog.



The options available here are essentially the same as in 3.24.

You can now use the Target Project Browse button to select a target project.

If the “Disable source objects after copy” is selected, the selected Document Objects will automatically be disabled after the copy session has been completed. This applies when the Document Objects is intended to be “moved” from one project to another.

Note!

- *Just like in export, there is an option available to include underlying traces in the export e.g. Hazards and Mitigations when exporting Failuremodes.*
- *Again, to recreate traces (including traces to and from linked projects) the relevant Document Objects / Projects must be currently loaded.*

3.26. Work with Linked Projects

Projects can be linked to each other in a hierarchical order to allow the re-use of common documentation in multiple products (or modules).

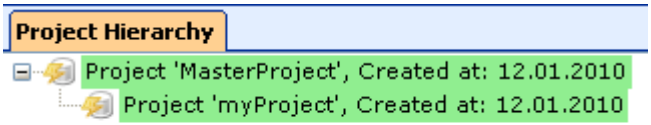
The most common scenario is to create documents for components and refer to the documentation in these components through traces from a master project that represents a System.

E.g. the sub module A is used in Product 2 and 3. The normal case is that a Product contains multiple sub modules, e.g. Product 1 has the linked projects sub module A, B, C and D.

To create a link to other projects, select the menu ***File > Add Linked Project*** in the menu tool bar and select the project you want to link to.

Note! It is not possible to create circular linked-project structures.

The chain of linked projects can be of arbitrary length. The project linking hierarchy is displayed when clicking ***Project -> Display Project Hierarchy*.**



In the ***Project Hierarchy view***, loaded projects are displayed in green. Yellow colored projects may be loaded later / on demand (right click and select ***<Load Project>***) and red colored projects can only be loaded if their parent projects are loaded as well.

In this view, parent project can also be loaded if one exists for the current project. The parent project will be loaded as a linked project i.e. no changes can be made in the document object attributes but traces can be set to and from objects.

The project that is linking to other project is called a master project (Product 1 above) and all other projects are called linked projects or sub projects (Sub modules A, B, C and D above). When linked projects are loaded (either after they are added or when the master project is loaded again), all their ***Explorers*** are also displayed in the Master Project.

When you open a master project linked to sub projects you will be prompted with a Login dialog for each sub project. If you click ***<Cancel >*** in the login dialog, the sub project in question (and all sub projects linked to it) will not be loaded.

Note! To open a sub project you have to use credentials from the sub project in question, not the master project. If the credentials in the sub project are identical with those in the master project, you will be automatically logged in.

It is possible to create traces from the master project to your linked projects (e.g.: You can trace a requirement in Product 1 to a specification in sub module A.) and vice versa.

Note!

- *Traces from master projects to sub projects are not automatically updated to the latest state of the document objects in the linked projects. Consequently you have to manually perform updated traces to these document objects every time the document objects in the sub project changes. The trace explorer (see 2.5.2) provides the function Trace to the latest revisions, to perform these updates in a convenient way.*
- *Linked projects are ignorant of the traces from master project. Traces from master project will not appear in linked projects. This also applies to traces from linked projects to their master project.*

To unlink a project, select the ***File -> Remove Linked Project*** and in the menu tool-bar and select the project to unlink.

Note! Traces from a master project to any unlinked projects still exist but are not displayed after the project has been unlinked.

3.27. Running a Regulatory Wizard

A user may run a regulatory wizard to either perform an audit or to e.g. classify the system according to a regulatory standard and generate initial requirements to implement a system according the standard. To run a wizard, select the applicable wizards from ***Wizard -> Run a Wizard*** and follow the instructions.
At the end a Wizard Report is generated to document the outcome of the wizard. The Wizard Report is found in the Project Explorer in the book with the same name.

To define a Regulatory Wizard, please refer to Defining Regulatory Wizards

3.28. Working Offline

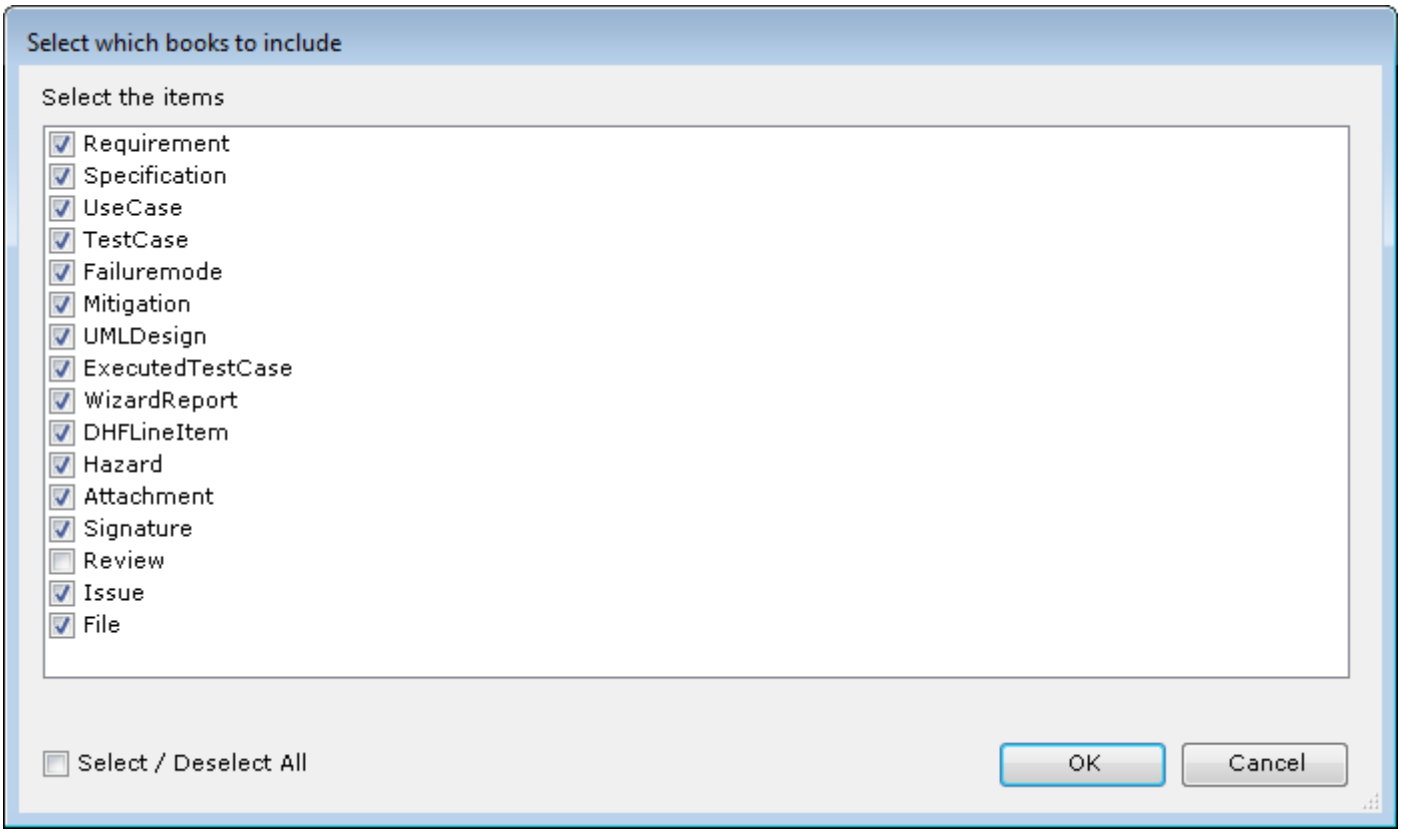
In case you want to work on your product documentation but do not have online access to the server, you can make a temporary local copy of the project on your hard-drive.

When you have completed your changes and have access to the server again, you can upload your changes to the server.

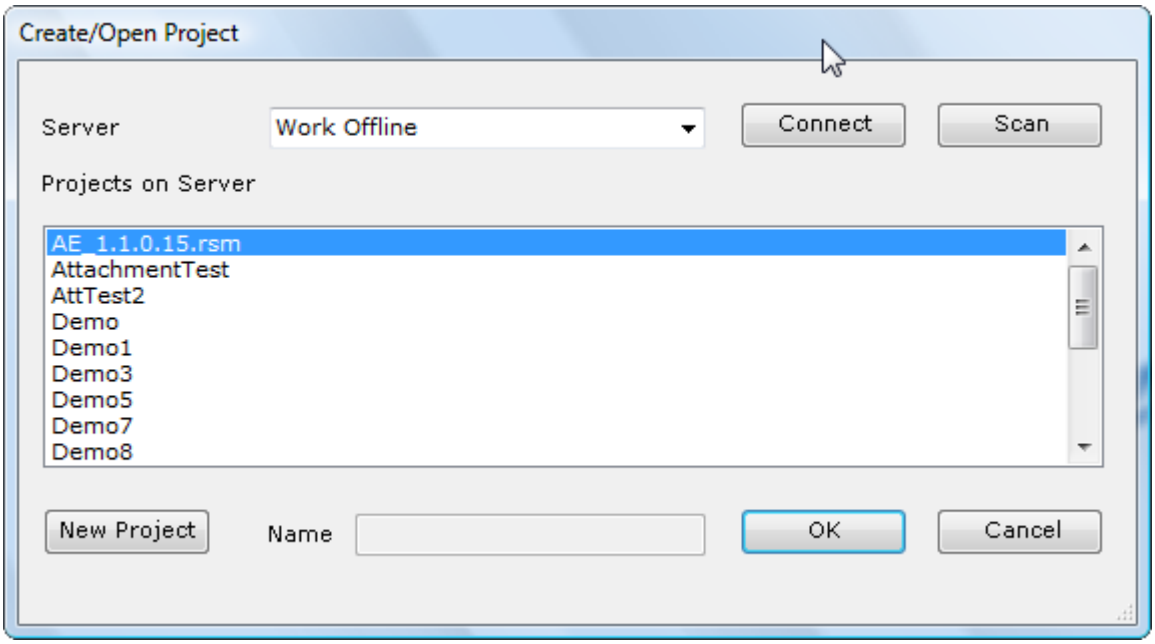
In the ***Project*** menu, select ***Take Project Offline*** to copy the project to your local drive.

This will create a local copy of the most recent revisions of all your document objects. The operation can take several minutes.

It is possible to select a sub set of Document Object types to take offline. If the ***Review*** type is not selected, then snapshot are not taken offline (which reduces the time to take a project offline considerably).



To use the offline version of the project the next time you log in, select the ***Work Offline*** entry in the ***Server*** combo box of the Create / Open Project dialog:



The project will load as normal and you can work without having to connect to the central repository server.

The function scope for working offline is restricted in some areas. Therefore, when working offline you will not be able to:

- Creating and modifying user and user groups
- Creating snapshots
- Linking and unlinking projects
- Closing Reviews

When you have completed your work and wish to synchronize your changes back to the online project, select the menu entry ***Project ->Take Project Online*** in the menu tool bar. If any conflicts exist between changes online and offline, they will be displayed to you and you can decide which version to use (i.e. the online or the offline version).

Note!

- *If you take a project offline several times you will be prompted that your existing offline version of the project will be overwritten with the current online version of the project.*
- *When taking an offline project online, Aligned Elements will do its best to synchronize all changes back to the online version of the project. You will be asked if you want to delete the offline project after it has been merged online, which is also the recommended action to perform.*

Otherwise taking the same offline project online a second time without having taken the synchronized version of the online project offline in the mean time might corrupt the online project.

Only the last state of the project content is merged back online. The project history in the online project will therefore not contain the complete project history of the offline project, but rather the changes made to accommodate for the merges.

Furthermore, there are a few content items that when changed offline will not be merged online:

- If a document object has been created offline but also disabled offline, this object will not be merged back to the online project.
- Project Settings changes will not be merged back.
- Query changes will not be merged back.

Note!

- *Chapters deleted offline and moved online will be merged back as deleted i.e. the user will not have the possibility to resolve this conflict.*
- *When the offline changes are merged back online, Aligned Elements will assign new timestamps to the merged project changes i.e. the server time of the merge action, which is not the same as the time as when the changes where originally made offline. Due to the merge algorithm, the order of the merged actions may differ slightly from the order of the original changes made offline.*

If the document object templates have been modified in either your Online or offline project, you will not be able to take the project online straight away. Before taking changes online again, load the offline project using the same templates as for the online project (contact your system administrator to handle this properly).

3.29. Create a project offline

It is of course possible to create a project offline. Just select the ***Work Offline*** entry when clicking ***< New project >*** in the ***Create/Open Project*** dialog. As usual you will be prompted to define the directory where your document object templates reside.

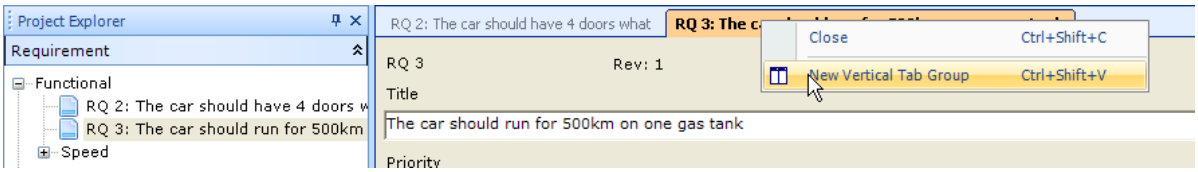
Note! Offline projects will be stored in the path C:/AlignedElemenets/Offline. If this path does not exist, Aligned Elements will try to create it. If your current Windows user does not have enough permission to create this path, Aligned Elements will fail and you will have to create this path manually.

You can at any point in time take the project online by selecting ***Project->Take Project Online***. You will then be prompted to select a server (at this time you might have to click the ***< Scan >*** button to scan for all available servers on the network).

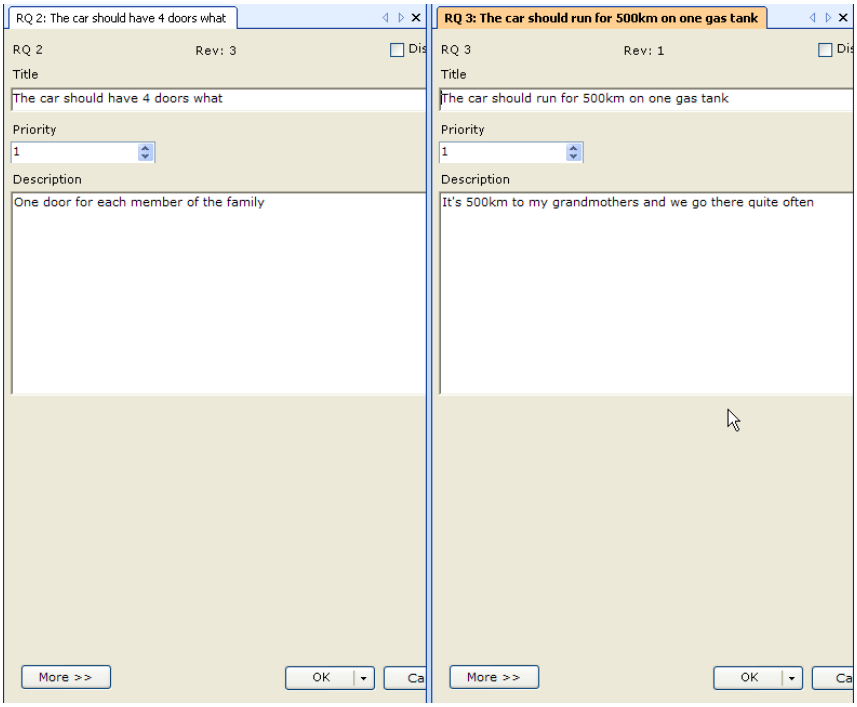
Note! If the online server contains a project with the same name as your offline project you will not be able to take it online on that server without manually deleting the online project from the server using SQL Management Studio.

3.30. Display two Document Object Forms next to each other

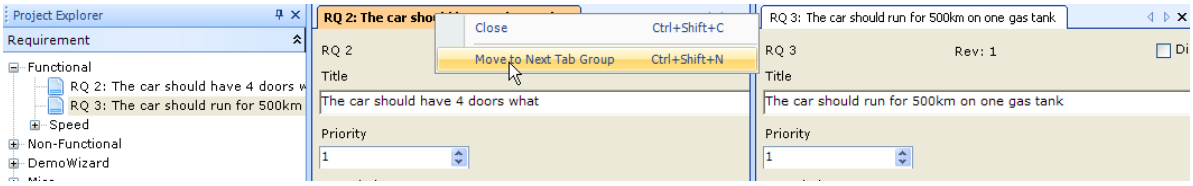
Display the document objects in the tab control by double-clicking on them in e.g. the ***Project Explorer***. When both objects are displayed, right click on the tab of one of the tab pages:



Select ***New Vertical Tab Group*** and the forms will be displayed next to each other:



If you have more document objects displayed in your tab control, you can move them to the right or left tab group with the help of the same context menu using ***Move to Next Tab Group*** or ***Move to Previous Tab Group***:



3.31. Modify the Gap Form Settings

It is possible to customize a few settings to define the behavior of the Gap Form.
The settings are stored in a text file in your template directory called ***GapFormSettings/GapFormSettings.txt***.

If you open the file you see line of text containing the following information:

<number of user comments>|
<standard comment1>$<standard comment 2>|
<Shall Last Used Comment be automatically inserted?(True, False)>|
<Shall the “Suppress Suspect” check box be enabled? (True, False)>

The first option defines the number of User Comments that shall be saved for reuse. The Gap Form uses a rolling list meaning that the last x comments are stored. When the user adds an x+1 comment the first comment is deleted and this comment is added. This setting is an integer (a number) and is set to 5 by default.

Note! The User Comments list is stored in a file in your Working Directory, i.e. not in the GapFormSettings file.

The second option is the standard comments available in the Gap Form. This can be any number of standard comments (separated by an $ sign). The Standard Comments can be used to classify specific changes tied to a statement in your own SOPs e.g. you can define in an SOP that any changes made to Document Objects that imply the Change Comment “Corrected Spelling” do not have to be reviewed in detail at the next review. Default comments are “Corrected Spelling” and “Corrected Formatting”. If you want to add more comments, remember to separate them with a ‘$’ character.

The third option is a True/False setting. If set to True, the last entered user comment is automatically inserted in the Change Comment dialog. If set to False, the change comment field is left blank.

The final option is also a True/False setting, to enable or disable the “Suppress Suspect” check box. If the user ticks this check box, the change will not set the object to suspect (provided that it has outgoing traces). The final True/False setting in the GapFormSetting.txt file enables or disables this check box for all users (i.e. ‘True’ enables it and ‘False’ disables it.)

4. Microsoft Word Integration

Aligned Elements is tightly integrated with Microsoft Word for easy creation and maintenance of Word documents.

The Aligned Elements Word Integration not only allows you to insert and display your document objects in a Microsoft Word document, but also enables you to work with your document objects in the Microsoft Word document, using bi-directional synchronization between the Aligned Elements database and the Microsoft Word document.

4.1. A Note about versions of Word

In Aligned Elements V1.X, integration with MS Words 2003 and MS Word 2007 is done by using a technology called "Customized XML tags".

Since Microsoft has discontinued the support of customized XML tags in MS Word 2010, Aligned Elements from V2.0 and onwards also supports an integration technology called "Word Content controls", which allows integration with Word 2007, Word 2010 and Word 2013.

These two technologies require different Aligned Elements word templates formats. However, the two technologies are not inter-compatible, implying that the customer must choose which technology to support in a specific template set.

The decision on which technology to use, depends on the version of MS Word applied in the company.

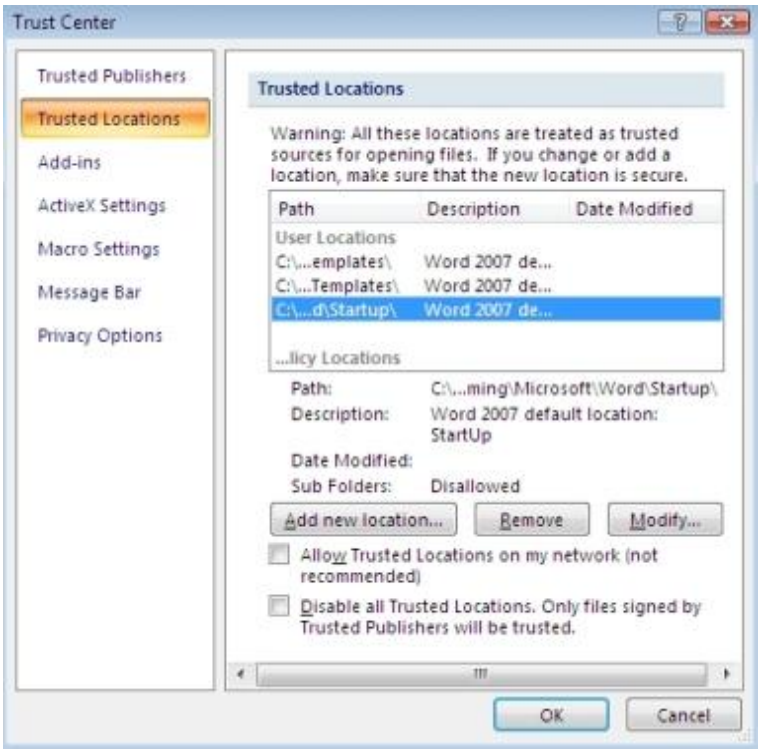
- If Word 2003 and/or Word 2007 are used, then the integration must be done with customized xml tags.
- If Word 2010, Word 2013 and/or Word 2007 are used, then the integration must be done with content controls.

	Word 2003 Professional	*Word 2007*	*Word 2010*	*Word 2013*
.doc	✓	✓	⊘	⊘
.docx	⊘	✓	✓	✓

Since Microsoft has discontinued the use of customized xml tags and is phasing out sales of MS Word 2003, Aligned AG will focus all future word integration development on the content control format from 2012 and onwards.

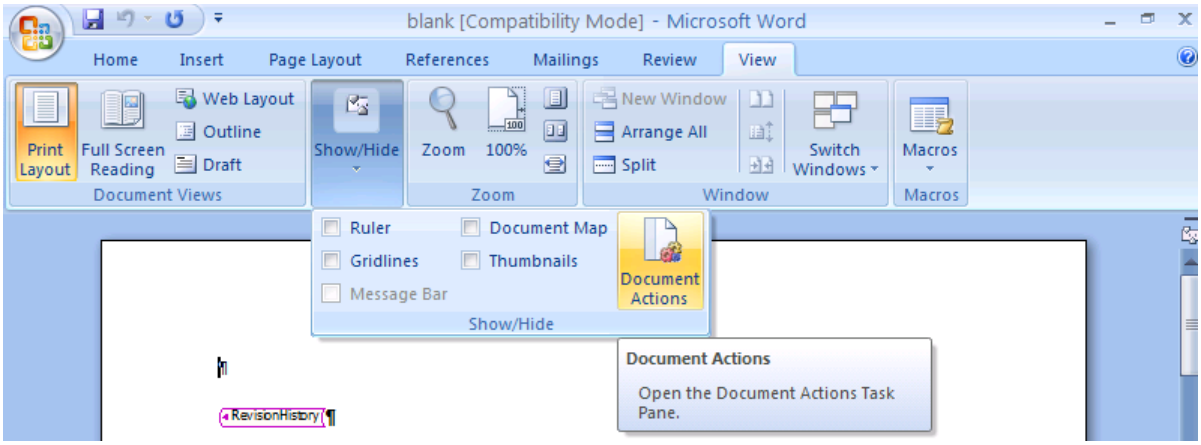
4.1.1. Trust message from MS Word 2007, Word 2010 and Word 2013

When opening a Word document from AE the first time, you will be prompted that the calling application (i.e. Aligned Elements) is not trusted. To avoid this problem, add Aligned Elements as a Trusted Location.



Do this by selecting “Add new location…” and browse to the installation path of Aligned Elements which is located under <document and settings>\<user>\AppData\Local\Apps\2.0. Do not forget to select “Valid for all Subfolders”.

When the Word document has been loaded, it might be the case that the Document Action panel is not visible. The Document Action panel is under the “View” menu option.



4.2. Adding a Microsoft Word document to your Aligned Elements Project

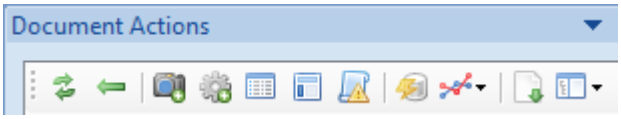
In order to load and integrate a Microsoft Word document in your Aligned Elements project, create a File Document object in the ***File Explorer***. See 2.5.3 for details about the ***File Explorer***. Then use the browse button to select the Microsoft Word document that you want to integrate. When adding a file with the extension “doc” Aligned Elements assumes that the file is a Microsoft Word document.

When the file is opened and displayed by clicking on the filename link, the Word Document is opened in Microsoft Word. In addition the ***Document Actions Pane*** is displayed next to your document in Word.

4.3. The Word Integration Document Action Pane

When working with a Microsoft Word document, the ***Document Action Pane*** will show a toolbar with the most common functions within the word integration. Just below the toolbar, a slightly modified ***Project Explorer*** is displayed.

4.3.1. The Word Integration Toolbar



The toolbar provides buttons for the following functions (Each of the functions will be explained in detail further down in this manual.):

Synchronizing
- Synchronize the document with the current state of the Aligned Elements database. For details see 4.7.

Forced Update
- Forced update implies that all Document Objects in the Word documents are replaced with the latest revision of the document object in the database. For details see 4.7.2. (Only for Word 2007 and higher)

Insert Snapshot
- Insert objects from a snapshot. For details see 4.8.

Insert Query
- Insert objects from a query. For details see 4.9.

Insert Revision History
- Insert revision History, creates a revision history that is automatically maintained with any changes to the document objects. For details see 4.13

Insert DHF Index
- Insert the current DHF Index.

Insert Risk Summary
- Insert the Risk Summary, see 3.21.

Show or hide mark-up tags (only when working with .doc)
- Show/Hide mark-up tag fields, which toggles the display of attribute tags.

Refresh Project

Refresh the project explorer with the newest data. For details see 4.10

Insert Trace Table

Insert trace table. For details see 4.15

Perform manually Import from the Word document

This toggles the display of the additional controls to manually import content from the document. For details see 4.14.

Select alternative Word Template set

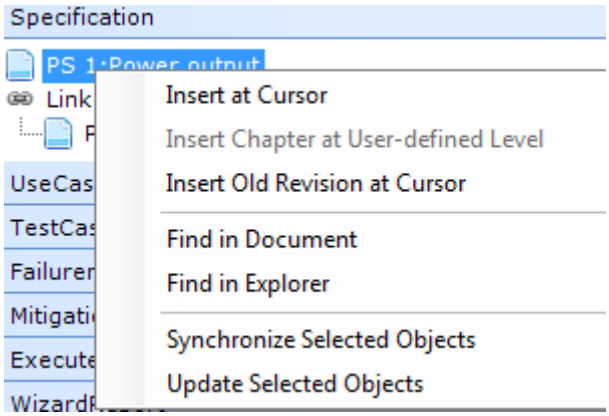
Activates an alternative Word Template set in order to alter the look-and-feel of the word insertions. For details see 4.16 (Only for Word 2007 and higher)

4.3.2. The Word Integration Project Explorer

Just below the toolbar, the ***Project Explorer*** is displayed. The ***Project Explorer*** is used to access the currently existing document objects.

The bottom section is used to display information about the current actions of the system e.g. when synchronizing, the system will indicate which document object it is currently working on.

Note! The Word Project Explorer does not update automatically on changes. To update the Word Project Explorer see 4.10.



- **Insert at Cursor**
  Insert the currently selected objects into the document. For details see 4.4
- **Insert Chapter at User-defined Level**
  Inserts the selected chapter at a defined word heading level. See 4.4.1.
- **Insert old revision at Cursor**
  Insert an old revision of the currently selected object into the document.
- **Find in Document**
  Finds the currently selected object in the word document.
- **Find in Explorer**
  Search for a specific ID in the ***Project Explorer.***
- **Synchronize Selected Objects**
  Performs a selective synchronization where only the objects selected in the ***Project Explorer*** are checked for modifications.

- **Update Selected Objects**
  Perform a forced update on the selected objects. See 4.7.2.

4.4. Inserting objects into a Microsoft Word Document

In order to insert and display a document object into your word document, select the object in the ***Project Explorer*** and then drag it to the desired position in your document.

Insert multiple objects at the same time, by selecting multiple objects in the project explorer by using the **< *Shift* >** key (select a continuous range of objects) or by using the **< *CTRL* >** key.

You can also drag one or more chapters into the word document. Consequently all objects in the chapters are inserted in the document. Note that it is also possible to drag a whole document object type section, e.g. requirements, into the document by simply dragging the header “Requirements” into the document.

Instead of using drag and drop it is also possible to just select the object in the ***Project Explorer*** and then press the **< *Insert Object* >** item in the context menu to insert the object at the cursor position.

Note! Each document object can only be added once to the document. However, it is possible to make a document object part of multiple documents.

4.4.1. Insert Chapters at User-defined Level

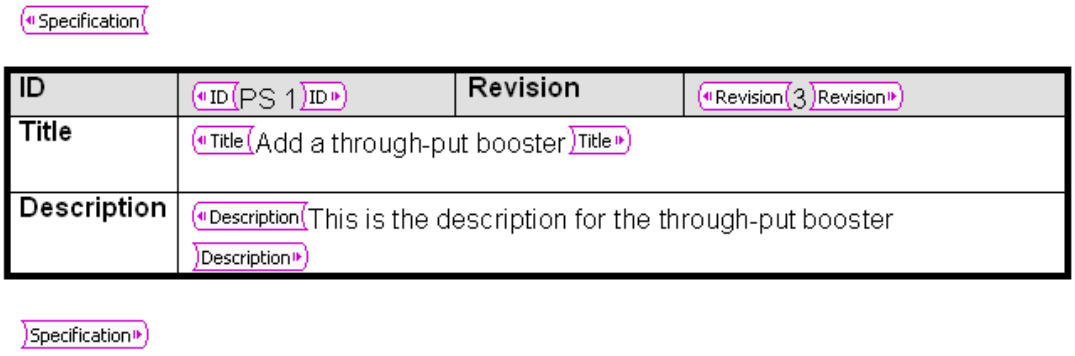
Per default, Aligned Elements maps its internal Chapter levels to Word headings when inserting chapters and objects into word i.e. inserting a book will map to a word heading of level 1, using its existing Word chapter templates accordingly.

It is however possible to customized this behavior and map the inserted chapter to a user-defined heading level. To perform this, use the Insert Chapters at User-defined Level in the context menu.

All sub chapters will be inserted on Word heading levels relative to the top chapter heading.

4.5. Attribute Tags

After inserting a document object you press the **< *Show/hide fields* >** button (see 4.3.1) to show the mark up tags of the attributes of the object.



This displays the text mass belonging to each attribute. Only changes made to the text between two attribute tags is subject to synchronization. When editing text fields in the word document it is recommended to work with tags displayed, in order to see exactly where each field starts and ends.

Note! Attribute tags are only possible to make visible for .doc documents in word 2003 or Word 2007. When working with .docx documents, the data is contained in Content Controls instead of these tags and will display automatically when clicking within the content control.

4.6. Edit a document object in Word.

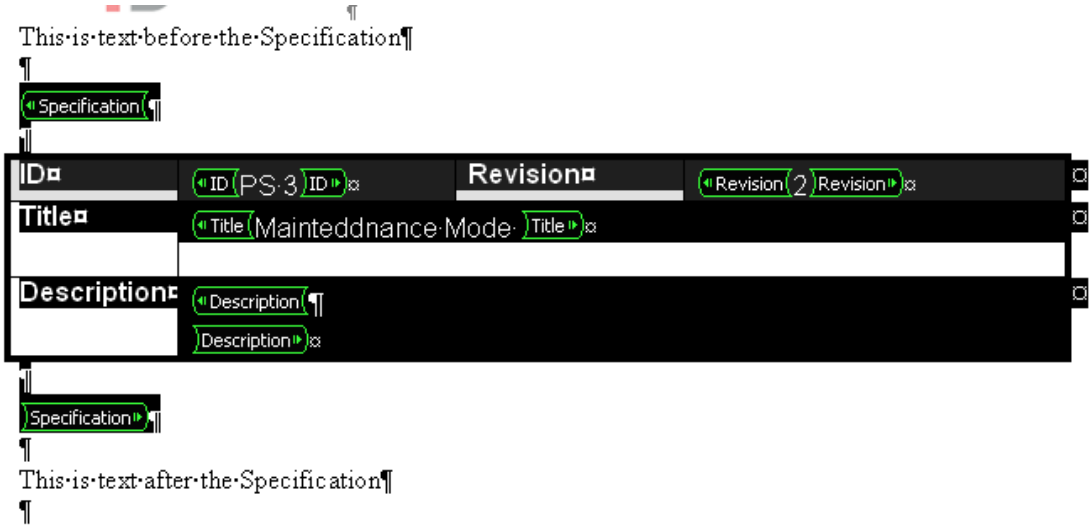
When a document object is placed into a Word document, you may edit the text fields directly in word. (For Word 2003: Select **< *Show fields* >** in the ***Project Explorer*** toolbar to visualize the attribute mark up tags (see 4.5)).

Note!

- *Not all available document object attributes are editable in Word (see 4.6.2)*
- *Only non-frozen document objects can be edited in the Word document.*

4.6.1. Deleting an object from the document

In order to remove a document object from your document, just mark the complete object and click the delete button on your keyboard. The best way to do this is to display the tags (see 4.5) and select a range of text, which (at least) includes the outer tags of the object.



This removes the document object from your Microsoft Word Document, but does not disable the object in the Aligned Elements database.

4.6.2. Invalid Entries

If an invalid text is entered into a field, e.g. a text where a numeric value is expected, the invalid text will be automatically reverted to the original text when you click somewhere else in the document.

4.7. Synchronizing a document with Aligned Elements

The Aligned Elements Word synchronization mechanism is bi-directional.

When you click the **< *Synchronize* >** button, the entire word document is scanned to detect deviations between the object displayed in the word document and the status of the same object in the database.

This means that the document objects stored in the Aligned database are updated with the changes you have made to the objects in the word document when you click the **< *Synchronize* >** button in the ***Document Action Pane*** toolbar. You will be prompted with a normal Gap Form dialog before you commit your changes to the database.

However, the bi-directional mechanism also implies that the document objects displayed in your Word document are updated with changes in the database made by yourself or other users if you have not made any changes to the objects in your word document (automatic update).

*Note! When you open a word document from a File Object containing document objects, the objects are not automatically synchronized as the word document is displayed. You have to explicitly click the **< Synchronize >** button to update the document objects in the word document to the latest revision.*

4.7.1. Synchronizing Chapters

If the templates for chapters are setup accordingly, Aligned Elements also synchronizes chapters. This affects the name of the chapters as well as their contents.

Chapter names that are changed in the database are updated in the document during synchronization and vice versa. When synchronizing chapters, Aligned Elements also checks if all Document Objects in a chapter are already part of the document. If they are not, the Document Objects are automatically added to the document.

Note:

- *From V1.7 and onwards, updateable chapter templates are delivered by default. For previous versions, you can request synchronizable chapter templates from Aligned. Also note that you need to replace current word content (i.e. remove the content from the word document and insert it from Aligned Elements again) for the synchronization abilities to affect.*
- *the core concepts are that: 1) Only Document Objects not already existing in the Word document are added. 2) Existing Document Objects in the word document are not moved or removed if the object has been moved to another chapter.*

The position of the added Document Objects in the Word document is based on the display order in the Project Explorer and is determined in the following way:

1. First, the Document Object preceding (in the Project Explorer) the object to be inserted is located in the Word document.

2. The Document Object to be inserted is inserted after the located Document Object.

3. If the preceding Document Object cannot be located in the document, the object is inserted directly after the chapter, before any other Document Object.

For details how to adapt the chapter templates for synchronization, contact support@aligned.ch.

4.7.2. Forced update of Document Objects

This option is intended to align the document content with the current state of the objects in the database and can be seen as a “one-way” synchronization.

This action can also be performed on selected document objects using the context menu in the Word Project Explorer.

Note! Any unsaved changes made to document objects in the document are ignored. The object content is replaced with the content from the database.

Note! Document Objects already having the most current revision in the document are also replaced. This allows you to update all objects to a different template.

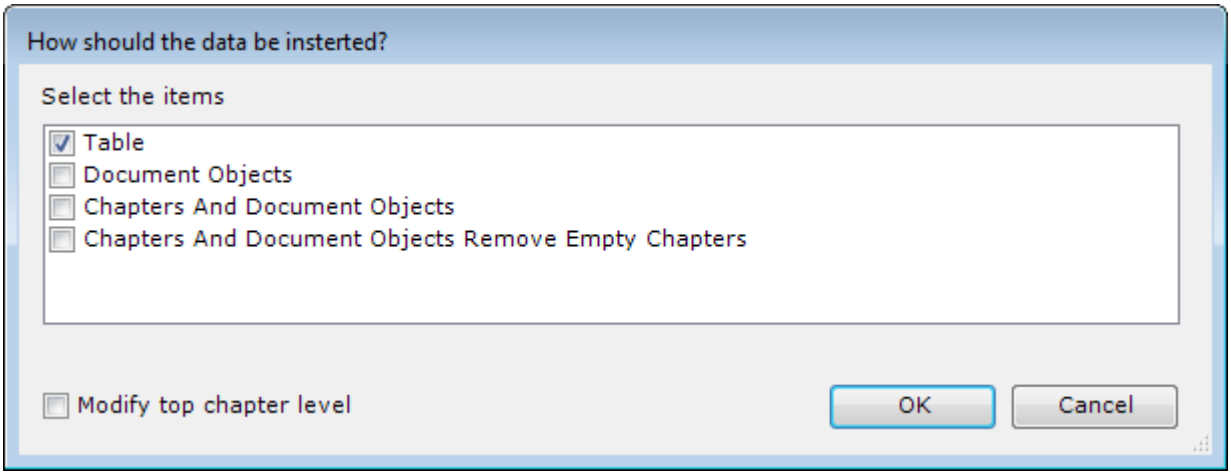
4.8. Inserting objects from a snapshot

When inserting document objects from a snapshot, the system will prompt you to select an existing snapshot. After this the system will enter the document objects which are part of the snapshot into the document. The first object is inserted at the current position of the cursor. The fields of these document objects cannot be edited in the document.

Note! If the snapshot contains objects which are not part of the word integration these are not displayed.

4.9. Inserting objects from a query

When inserting objects from a query, the system will prompt you to select an existing query. After one of the queries is selected, the following prompt appears.



It is either possible to simply insert all objects from the query into the document or create a list of them.

4.9.1. Inserting objects from a query as a Table

When inserting objects from a query as a list, the objects are listed in a table. The appearance of the table is determined by a word template for query tables. See 0

4.9.2. Inserting objects from a query as individual Document Objects

When choosing to insert them as individual document objects they are inserted as document objects as usual and will be synchronized together with the query. The included document objects cannot be manually edited in the Word document.

4.9.3. Inserting objects from a query as Chapters and Document Objects (Remove Chapters)

When choosing to insert the set as chapters and document objects, all chapters are included for the Document Object Type but only the Document Objects that matched the query. When the document is synchronized, the content of the query is updated. The included document objects cannot be manually edited in the Word document.

You can optionally choose to not display empty chapters. Parent chapters are however still displayed even if they don't contain any Document Objects of their own.

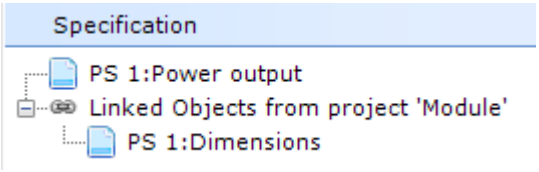
Note that there is the optional possibility to define the word heading level to which the top level chapter shall be mapped.

4.10. Refreshing the Project Explorer

After launching the word integration, the Word Project Explorer is NOT updated automatically when changes are made to objects. However this does not apply to document objects from linked projects. To update your project explorer with the newest data from linked projects use the **Refresh Project Explorer** button.

4.11. Working with linked projects in the Word Integration

If your project has other linked projects, see 3.26, the Word Integration will prompt you to decide if you want to display traced objects from these linked projects. If you decide to do so, all objects which are directly traced from your project are also displayed in the ***Project Explorer***. For each document object type, the traced objects from linked projects are shown in a chapter with the name of the project. E.g. all specifications from a linked project (which are traced from your master project) will be inserted into a directory with the name of your linked project. The directory structure directly below this chapter is the current chapter structure from the linked project.



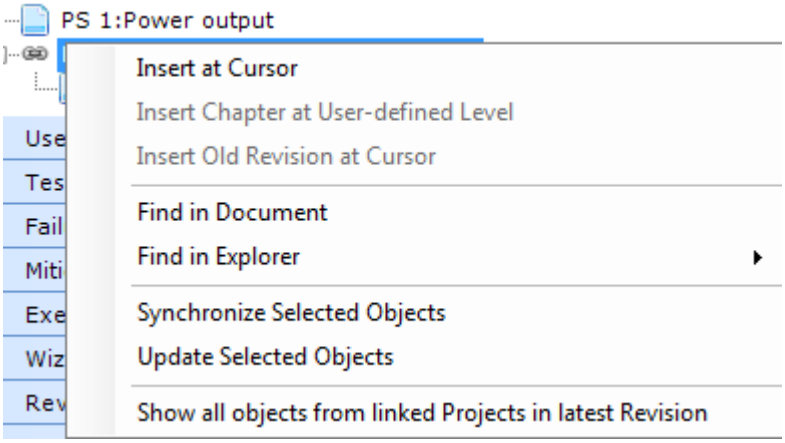
Document objects from the linked projects can be inserted into the document, just as any other document object, but they cannot be changed in the document.

Note!

- *Because traces to objects in linked projects refer to a specific revision of that object, it is possible that the object was initially in a different directory than the directory in which it currently placed.*

4.11.1. Displaying Document Objects from linked projects in Word Project Explorer

Per default, only those document objects from the linked projects are shown, which have traces from the master project in their **traced revision** i.e. linked objects that are **not** traced from the master projects are **not** displayed.



To display all linked objects (including non-traced objects) of latest revision from the linked project, right-click on the “Linked Objects…” node and select “Show all objects from linked Projects in latest revision”.

4.11.2. Synchronization of Document Objects from Linked Projects

If objects from a linked project were inserted with the “Show all objects from linked Projects in latest Revision” option active, the synchronization will update these objects to the newest revision available. If the option was not active when the object was inserted, the object will be updated to the currently traced revision. In both cases the objects cannot be edited in the document.

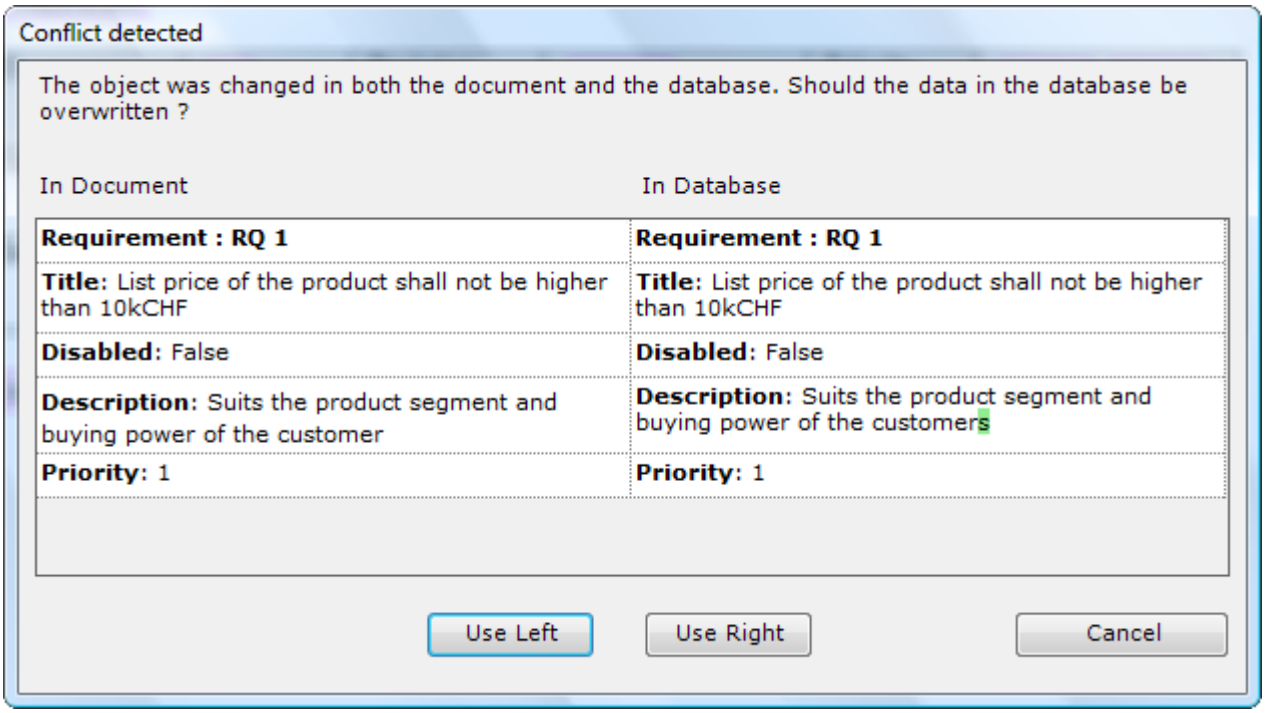
4.12. Conflicts at synchronization

When working with document objects in a Microsoft Word document, the following situation can occur:

- You edited a document object in the word document.
- The same document object was changed by another user in the database.

As a result the document object was changed in both places.

Should the case arise where an object has been changed in the document AS WELL AS in the database, the system will prompt you to choose which of the versions of the document should overwrite the other.



By choosing the current version from the database, the changes made to the object in the document are overwritten with the current version of the object from the database.

When choosing to overwrite the changes in the database with the changes made to the object in the word document, the document object is updated in the database to a new revision.

Each time a document object is updated in the database, the gap dialog appears as usual.

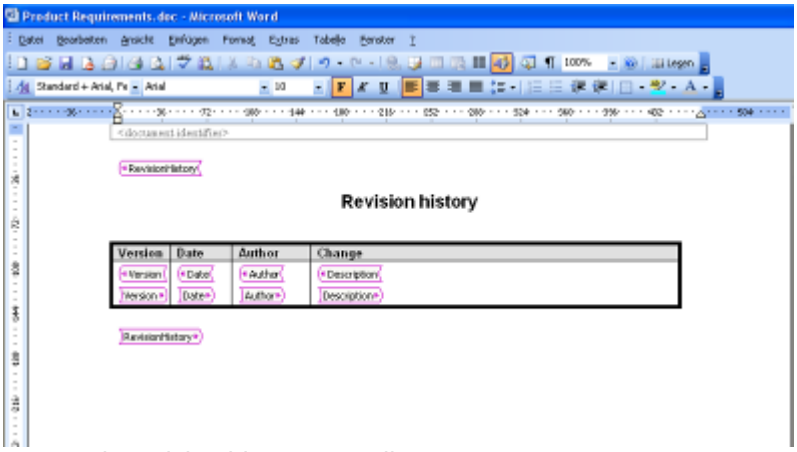
If you **< *Cancel* >** in a conflict situation, the object is not “synchronized”, i.e. the decision in how to resolve the conflict is postponed until the next synchronization.

Note! If you cancel the changes are NOT reverted and stored in the word document if you save the document. The next time you open the word document the changes are still there. If you wish to revert to the original version of the document object, delete it from the word document it and insert it at the same place again.

Changes in the document outside of document tags are of course not written to the database and are only part of the document. These changes are saved as you click **< *Save* >** in your the Word Application.

4.13. Automated Document Revision History

The Aligned Elements Word Integration features an automated revision history recording. To insert a revision history into the document, just place your cursor at the position where the revision history should be placed and click press the ***< Insert Revision History >*** button. The system now inserts an empty revision history.



Automatic revision history recording

From now on the following changes are automatically recorded in the revision history.

- Changes to any fields of document objects in the document.
- Inserting of document objects into the document from the project explorer
- Deleting of document objects from the document.

Version¤	Date¤	Author¤	Change¤
0.1¤	07.03.2007¤	eric¤	¶ The·Specification·PS·3,·rev.·3·<Title>·'Maintenance·Mode·for·Product'·was·added·to·the·document.¶ ¶ PS·3·was·updated.·<Title>·was·changed·to·'Maintenance·Mode·'.¶ ¶ The·Specification·PS·3,·rev.·3·<Title>·'Maintenance·Mode·for·Product'·was·removed·from·the·document¶ ¶ ¤

4.13.1. The revision history and synchronization

When the word document is updated with newer revisions from the database (during the synchronization), the change comments entered when creating these revisions are transferred to the change column in the revision history.

Since the recording granularity of the revision history is very fine grained, your revision history will quickly become very extensive. It might therefore make sense to place it at the end of the word document rather than at the beginning.

4.13.2. The Versions in the Revision History

The initial version number in the automated revision history starts with 0.1. All changes performed in a single session are recorded under the same version number. When opening the document the next time, the previous version number is incremented by 0.1.

Note: The version after 0.9 will be 0.10 and not 1.0

The version number can be manually edited. If at a certain time you choose to upgrade your version number to 1.0 just edit the version number. From now on, the system will start incrementing from 1.0, i.e. the next version number will be 1.1.

4.13.3. Inserting Aligned Elements File Version and Project Name

It is possible to have the Aligned Element file version and project name displayed in your word document (e.g. in the document header or footer) using the Word Document Properties.

For Word 2003:

- In the menu "Insert", select "Field". In the list of available fieldnames, select "DocProperty" and then in the second column of available properties, select "Version" or "Project".

In Word 2007, 2010 and 2013:

- In the main menu item "Insert", select "Quick Parts" and then "Field". Then proceed as with word 2003.

The "Project" document property is automatically created by Aligned Elements, so it will always be available.

The "Version" property is created once a revision history is entered (if the history is removed, the property stays there of course). If no history is entered, it is possible to manually modify the version by editing the field value in the word document.

If a revision history exists, the version field will contain the most recent version entry of the revision history. The "Project" is always set to the master project name.

It is possible to have multiple instances of both fields in the document.

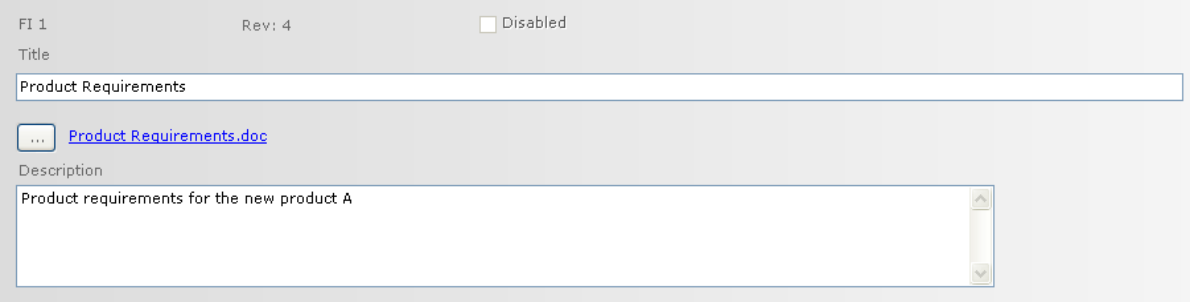
4.14. Import Document Objects from Microsoft Word

To import an existing data from e.g. a Product Requirement Word Document into Aligned Elements proceed as follows:

1. Create a new File Document object.

2. Add title and a description.

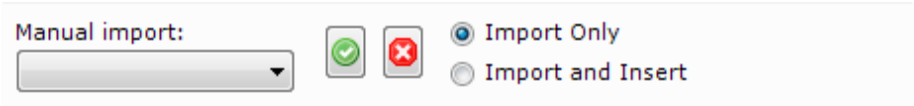
3. Browse to the Microsoft Word document you want to import and select it.



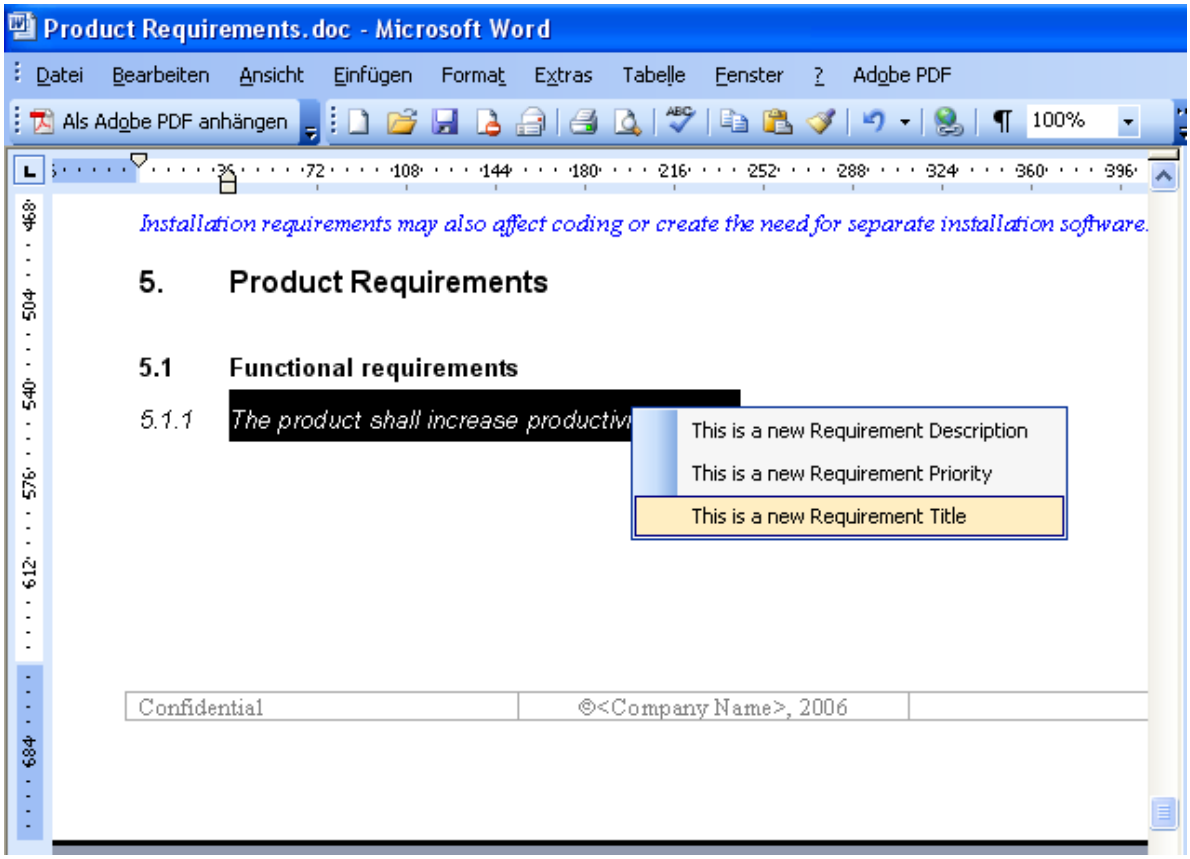
4. Open the Word document from the File Document object by clicking on the hyper link of the file name next to the ***< Browser >*** button.

5. The Word document is opened and displayed in Word and the ***Project Explorer*** is displayed next to the document.

6. In the toolbar above the ***Project Explorer*** in the document you can set the current Document Object Type ***(Currently working with)***. Since we in the case deal with a Product Requirement Document, we select *Requirement.*



7. Now, select some text in the word document that describes the title of an existing Requirement and right-click and select “This is a new Requirement Title” in the context menu.



8. Continue to select text and assign to the still available attributes.

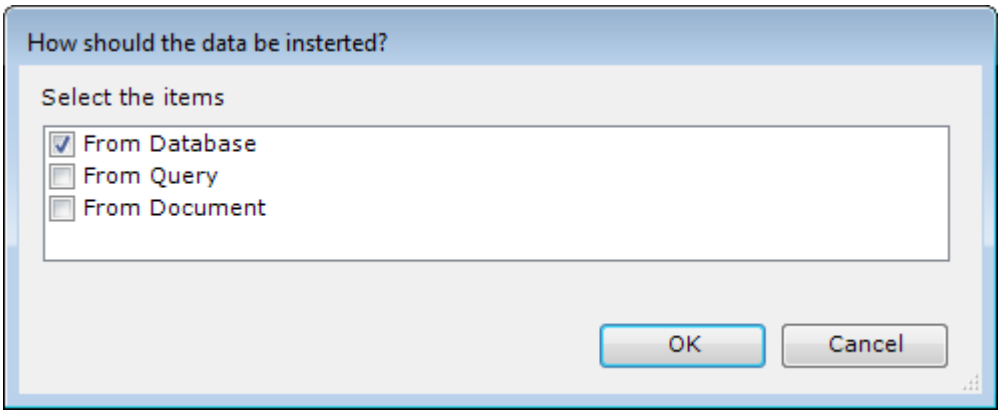
9. When completed, click  in the toolbar to save as a new object. The Radio button Import Only/Import and insert, controls if the Document object should also be inserted into the word document.

Note! You can only import one attribute data for one document object at a time.

4.15. Trace Tables

To create a trace table in your document, select the menu item ***< Insert Trace Table >*** from the toolbar. The trace table is created according to the available templates (see 0). The created table should not be manually edited since it is automatically synchronized according to the traces in the project database.

After choosing to insert a query table a dialog similar to the following dialog will appear.



Now you choose if you want to insert a trace table for:

- all objects of a given Document Object type from the database
- the objects in the output set for a given Query
- all objects residing in this Word document.

Note!

- *The system will only display queries which contain the appropriate Document Object type of objects.*
- *A trace table contains a number of parent objects from a certain document object type. The trace table always contains all available document objects in the project of the parent type i.e. it is not possible to display a trace table for a subset of a parent document object type.*

Traces from Requirements to Specifications:

Requirement	Specification
RQ 1 (List price of the product shall not be higher than 10kCHF)	PS 1 (List price of the product shall not be higher than 10kCHF)
RQ 2 (The product must be QSR CFR 21 Part 11 compliant)	PS 2 (The product must be QSR CFR 21 Part 11 compliant)

4.16. Applying Word Template variants

It has been recognized that not all stakeholders are interested in the same document object data from Aligned Elements. To accommodate this you can have several Word templates for a single type name e.g. one requirement word template for formal output and a different requirement template for informal output.

Defining a Word template variant is done by adding a prefix to the template name i.e. if we want to create variants for that we define as “RnDStyle” in the main set a template might be called “RnDStyle.Requirement.docx”.

All Word templates prefixed with “RnDStyle” are perceived as belonging to the same variant set. If a variant does not define a specific template, the template without a prefix is used. To select which variant style to apply, use the “Template Variants” drop down button. The selected variant is then applied for the next insert session. Note that synchronized that are synchronized are also using the currently selected templates set.

5. Troubleshooting

5.1. The Action Pane does not display in the Word Integration

Either the Action Pane is hidden but accessible or inaccessible all together.

Click Ctrl-F1 in word (Word 2003) to attempt access the general task pane and see if you can find the Action Pane in the drop down list.

It might also be the case that the Action Pane Active X component is blocked on your computer. Check for the registry key:

HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Internet Explorer\ActiveX Compatibility\{5f61f809-422a-4152-91f5-9ec1b935efd7}

If you find it, delete it and start Aligned Elements again. This time the Action Pane should be accessible in Word

5.2. How to recover the last document changes after a Microsoft Word crash

When Microsoft Word crashes while editing a word document containing modifications that you have not yet committed, you can restore your last changes through the following procedures.

1. If Aligned Elements is still open, close it with the Task Manager to avoid any internal clean up actions.

2. Start Microsoft Word in standalone mode (i.e. not from Aligned Elements)

3. Use the recover option to recover the last auto-saved version of the word document in question containing your modifications.

4. Select the most recent version of the word document and save a copy to e.g. your desktop (using File/Save As). This document contains your modifications but is not yet stored in Aligned Elements.

5. Start Aligned Elements, open the project in question and open the corresponding File Document Object in the ***Document Object Form***.

   Note! ***Do not click on the hyperlink in your File Object*** *since this will cause Aligned Elements to retrieve the last stored version from the project database and might overwrite your unsaved changes.*

6. In your File Object in Aligned Elements, replace the linked document with this copy you saved in step 4. Browse to the location where you saved the copy of the recovered document.

5.3. Aligned Elements has a problem while working in Microsoft Word

If Aligned Elements e.g. crashes or in another way poses a problem while you work in Microsoft Word, please follow these instructions:

1. To not loose and changes to your current Word document, save a copy of the document to e.g. your desktop (using File/Save As).

2. Close Microsoft Word.

3. Start Aligned Elements and log in to your project again.

4. Select the file object containing the file you where previously editing.

   Note! ***Do not click on the hyperlink in your File Object*** *since this will cause Aligned Elements to load the last stored version from the project database and which overwrites your unsaved changes.*

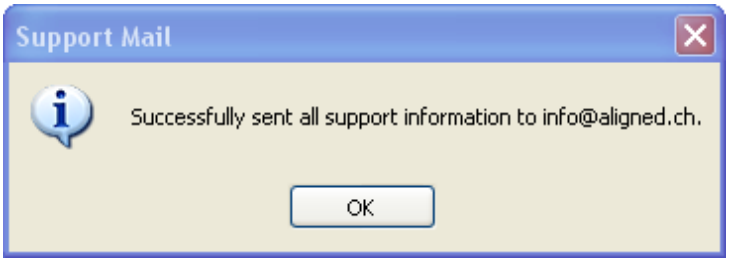
5. Browse to the saved document. This will cause the file object to be updated with your most recent changes in your Word document.

6. To continue editing the document, click on the hyperlink with the document name again to open it with Microsoft Word.

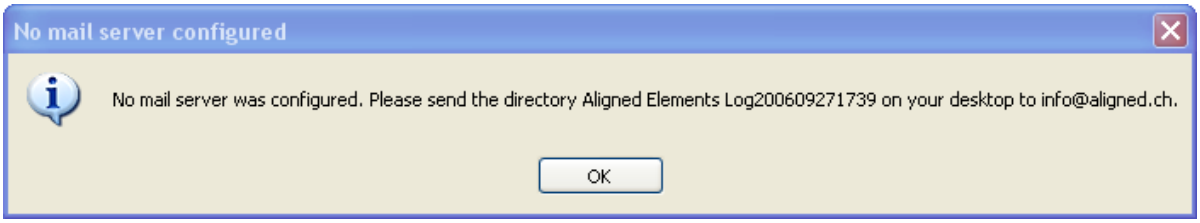
5.4. To Report if an Error Occurs and Get Support

If an unexpected error occurs, the execution trace is logged in the application log files. You can automatically report the error and send the log files per mail to Aligned AG. These files are only understandable to the developers of Aligned Elements.

In the menu ***Help*** you find the entry ***Mail Logfiles To Get Support***. Click on it and the log files from the last hour will be sent to support@aligned.ch automatically.



If you have not set up the name to your company mail server as described in (section 6.3) there may be an error while trying to send. In that case, all relevant files are copied to your desktop and you are requested to manually send them to support@aligned.ch.



Error if no mail server was configured

The sender of the mail is taken from your user information, so make sure that you enter a valid mail address for each user account established (see 6.2). It also makes it easier for us to get in contact with you for further support.

If an unexpected error occurs in the application, you are this asked if you want to mail the log files for support. Please do so. These log files will greatly help us improve the application.

6. Tool Administration

6.1. Spell-checking Dictionaries

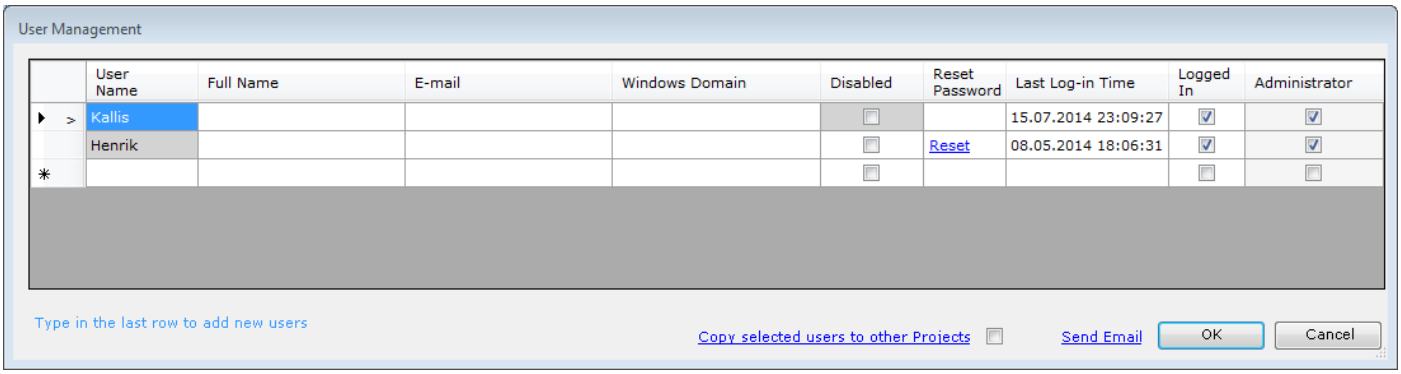
Aligned Elements supports Hunspell dictionaries (can be downloaded from http://www.textcontrol.com/en_US/downloads/dictionaries/) and includes the dictionaries for English, German and French as part of the installation. Due to the memory required to load a dictionary only English is active per default. German and French dictionaries can be found in the folder <Installation Directory>/DictionariesNotUsed. To allow Aligned Elements to load these at startup, please place a copy in the folder <Installation Directory>/Dictionaries.

Note: you may need Administrator privileges *on your PC to do this.*

You may also define your own dictionaries dynamically. This is called a User Dictionary. User dictionaries should reside in on a network location where all project members have read and write access. Please make sure that a common directory for user defined dictionaries exists (see 6.5 Project Settings)

6.2. User Management

In the menu ***User Management->Manage Users***, you may add, modify and disable users. Users cannot be deleted (this would make the project history inconsistent) but they can be disabled.



Dialog for management of users

A user must belong to one or more user groups. A user group defines the permissions/rights with regard to the available document object types.

When a new user is added, the initial default password is the same as the user name and has to be changed after the first login.

If a user has forgotten the password or failed to log in correctly more than three times, the administrator can reset the password to its default value i.e. the user name.

6.2.1. Copying users to other projects

To copy new or existing users to other projects, tick the check box ***Copy users to other projects*** in order to display the ***Copy*** column in the ***User Form***.

Select the users to copy and click ***OK***.

Optionally, select to overwrite/amend information to existing users if found in the target project(s).

Then select the target project(s) in which to copy the selected users.

Note! If you have made changes to users in the User Form, the changes are applied to the users before the copy action takes place.

Note! The current logged in user must have User Management privileges in the target project(s) in order for the copy to function.

If the User does not exist in the target project(s), a new User with the corresponding user data is created. For the new user, the default password will be the same as the user name.

If a User with the same name as the copied user exists in the target project(s), the Full name, Email, Windows domain and user groups (provided that they exist) are copied to the user in the target project.

Disabled users cannot be copied.

Passwords are never copied. Password reset does not apply to copied users.

If a user group associated with the copied user exists by name in the target project(s), the user will be automatically be associated with that user group.

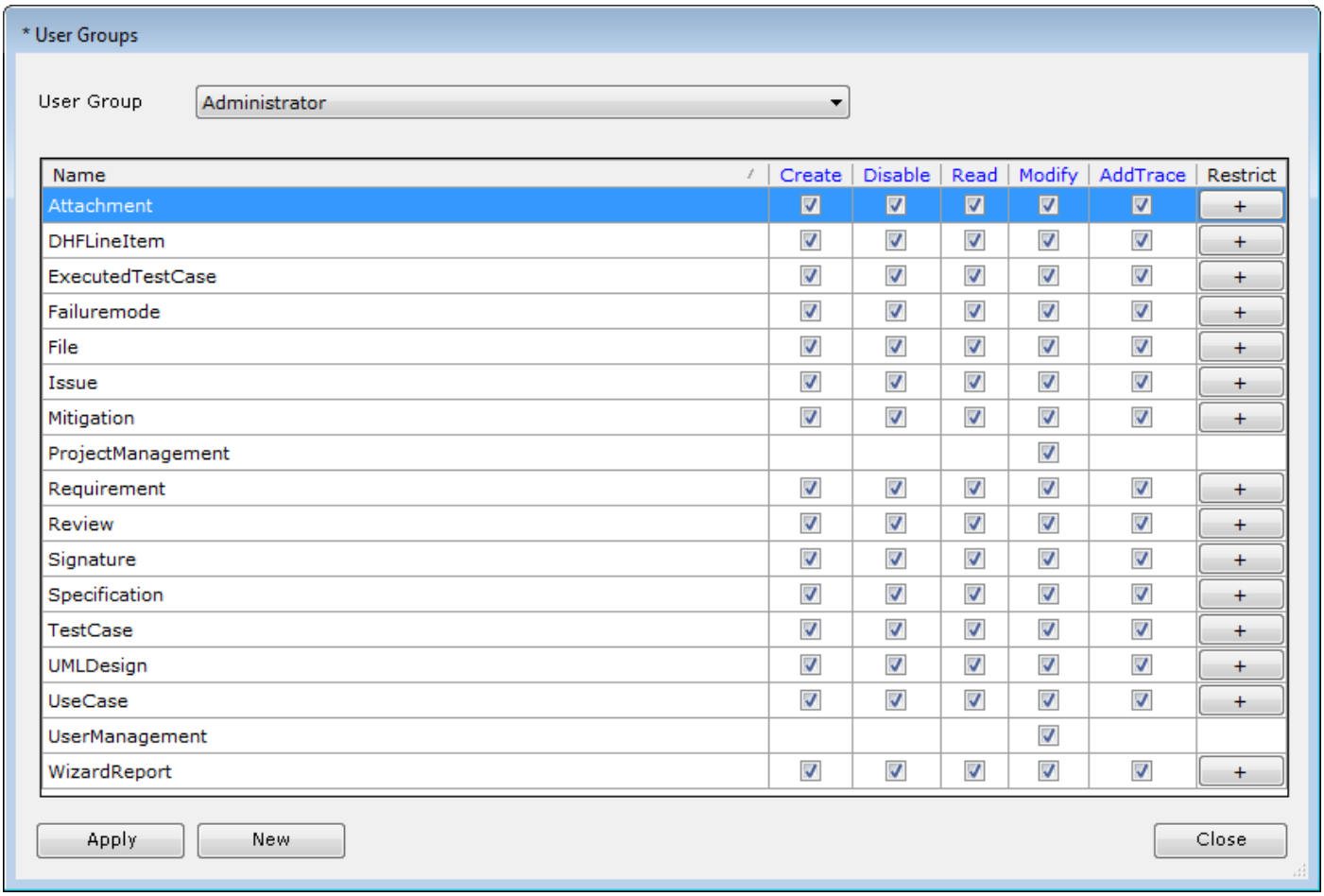
If a user group associated with the copied user does not exist by name in the target project(s), that user group association will not be recreated in the target project.

If the user exists in the target project(s), copied user group associations are only added to the target user, user groups are never removed as a result of the copy action.

Note! If no user groups can be associated with the copied user in the target project(s), the user will not be created in the target project(s).

6.2.2. User Group Management

To edit the user groups select the menu ***User Management->Manage User Groups***. In the user group dialog, you can add new user groups and also adapt the permissions/rights for each type of document object.



The rights for a user group listed per document object type

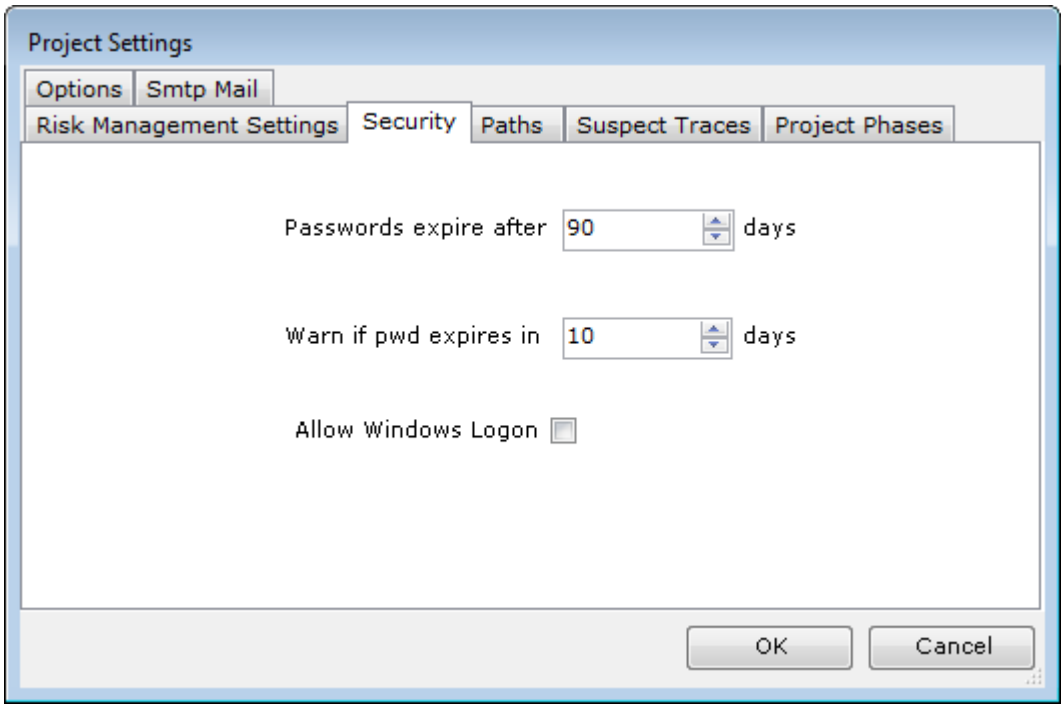
Use the ***Restrict*** button to the right to restrict a user group from editing a particular attribute or selecting a particular enumeration value for an enum attribute.

Clicking on the column names to tick or un-tick all checkboxes in a column.

6.2.3. Using Windows password as alternative login

It is possible to alternatively use your windows password for login. This can be especially useful if you are simultaneously active in a large number of projects and are forced to keep track of many different passwords. To enable the Windows login the following conditions needs to be satisfied:

- The Aligned Elements user name needs to be identical to the Windows user name.
- The global project setting “Allow Windows Logon” needs to be activated.



- The Aligned Elements user needs to define the windows domain in which the windows user is active. This is done in the User Management dialog.

6.2.4. Export Users

It is possible to export the user information to file. Click ***User Management -> Export -> Users*** and select and output directory. A file with the name Users@<ProjectName>.urs is created containing all the user information except the password about the users in the project. This file can later be imported in different project.

Note! Passwords, user certificates, certificate passwords (for electronic signatures) and Proxy Users (users for Trac and Jira) are not exported.

6.2.5. Export User Groups

It is possible to export the user groups to file. Click ***User Management -> Export -> User Group*** and select an output directory. One file per user group with the naming convention UserGroup@<ProjectName>@<UserGroupName>.urg is created containing the user group definition. These files can later be imported in different project.

6.2.6. Import Users

To import users, click ***User Management -> Import -> Users*** and select a valid .urs file.

For each user listed in the file, you will be asked if you want to import it.

The initial password for a created imported user is set the user name (just like when you create a user) and has to be changed at first login.

If a user with the same user name already exists, you will be asked if that user shall be overwritten with the data in the file.

If a user group associated with the imported user does not exist in the target project, that user group association is deleted after import.

If a user group associated with the imported user exists in the target project, the user will be automatically be associated with that user group.

6.2.7. Import User Groups

To import user groups, click ***User Management -> Import -> User Groups*** and select one or more valid .urg files.

If a user group with the same name already exists, you will be asked if that user group shall be overwritten with the data in the file.

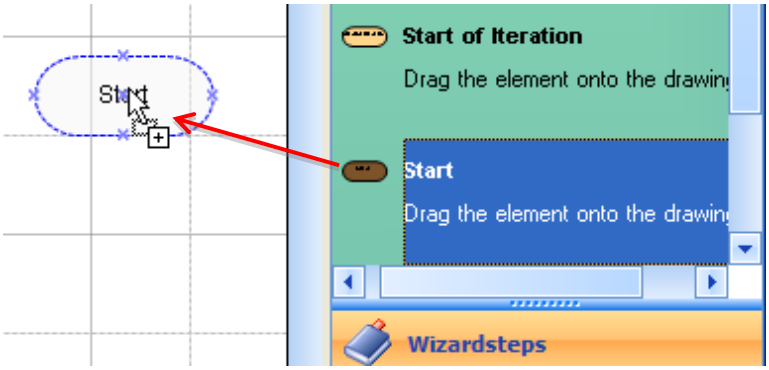
If an imported user group contains User Rights associated with Document Object Types that does not exist in the target project, those User Rights will not be imported.

If an imported user group lacks User Rights associated with Document Object Types that exist in the target project but did not exist in the source project, those User Rights will be added with maximum permission.

6.3. Defining Regulatory Wizards

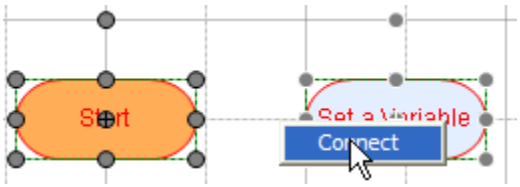
To define a wizard, please start with setting the wizard directory ***Wizard>Set Wizard Directory*** to a location which all users of the wizards can reach. All created wizards will be stored there.

The wizard designer offers a number of building blocks referred to as Wizard steps. Wizard steps are placed on the canvas by dragging them from the right hand side onto the drawing canvas with the mouse:



Drag steps onto the canvas

The steps can be connected by selecting 2 steps and pressing the right mouse button:



Connect Wizards Steps

Steps or connectors can be deleted by selecting them with the mouse and pressing delete.

The following Wizard steps are available:

- **Start**
  Defines the start of the wizard. Is required in all wizards.

- **End**
  Defines the end of the wizard. Is required in all wizards.

- **Ask a question**
  Ask the user a question. As a result different paths in the wizard are taken.

- **Set a Variable**
  Ask the user for information and store this in a named variable.

- **Query for Multiple Items**
  Same as *Set a Variable* but allows multiple answers from the user. These answers can be iterated through with the help of *Start of iteration/End of iteration.*

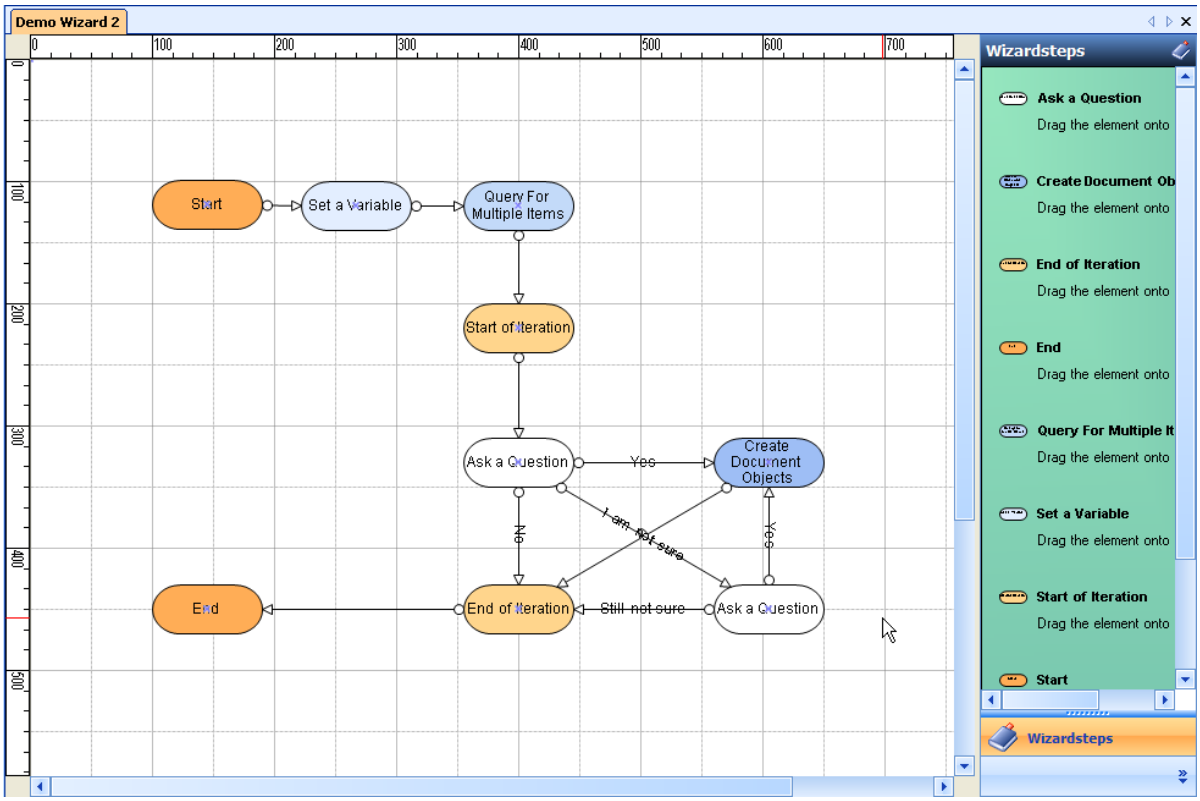
- **Create Document Objects**
  Create document objects of a certain type. The document object text (Title) may contain the value of a variable from e.g. *Set a Variable* or *Query for Multiple Items.*

- **Select Objects**
  This step is intended for Regulatory Wizards created for audits and allows the user to drag document objects from the existing project to prove objective evidence for the Question made in the step.

- **Start of Iteration**
  The step starts an iteration over a list of entries

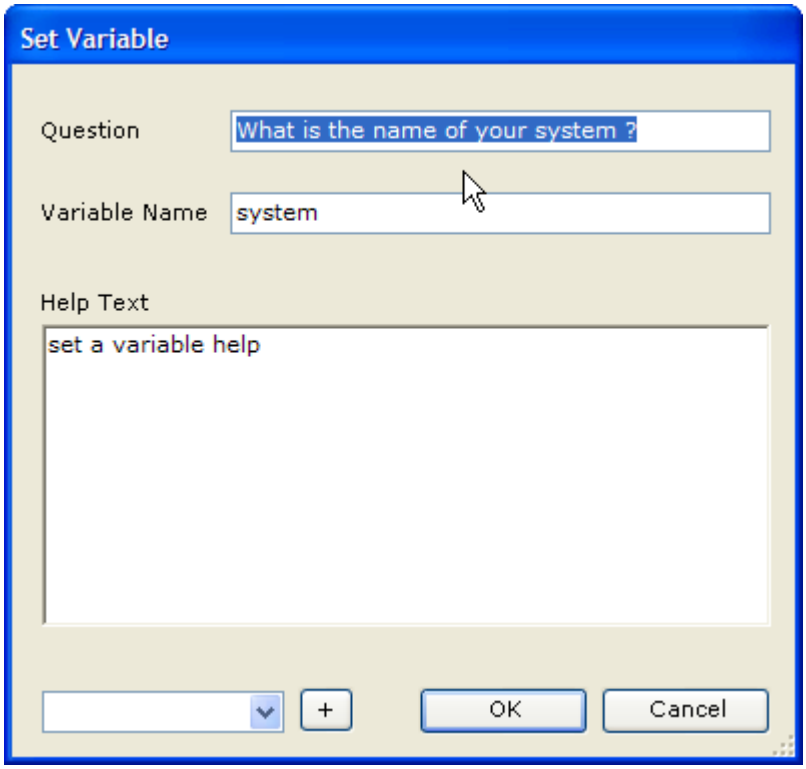
- **End of Iteration**
  The step marks the end of an iteration loop.

As an example on how they can be used, we will look at the Demo Wizard:



1. The *Start* step initiates the wizard and provides some introduction text to the user.

2. In *Set a Variable* the user is asked to provide a system definition, the response is stored in a the variable {system}:

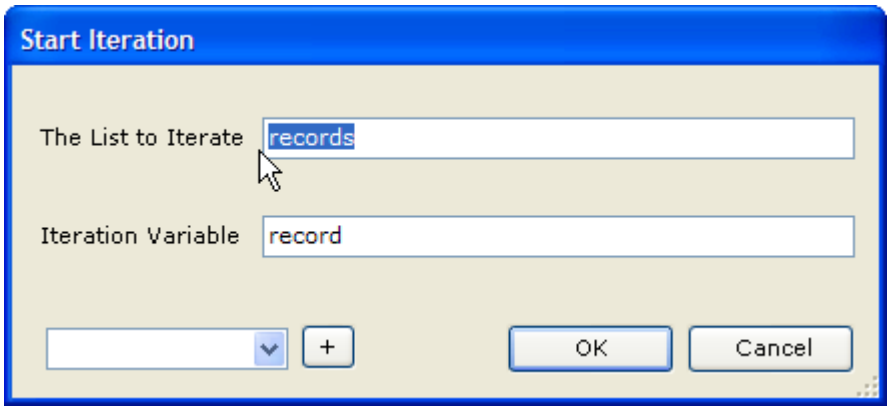


3. In Query for Multiple Objects. The system is asked for possible records that are used by the system. The result is stored in the variable {records}.

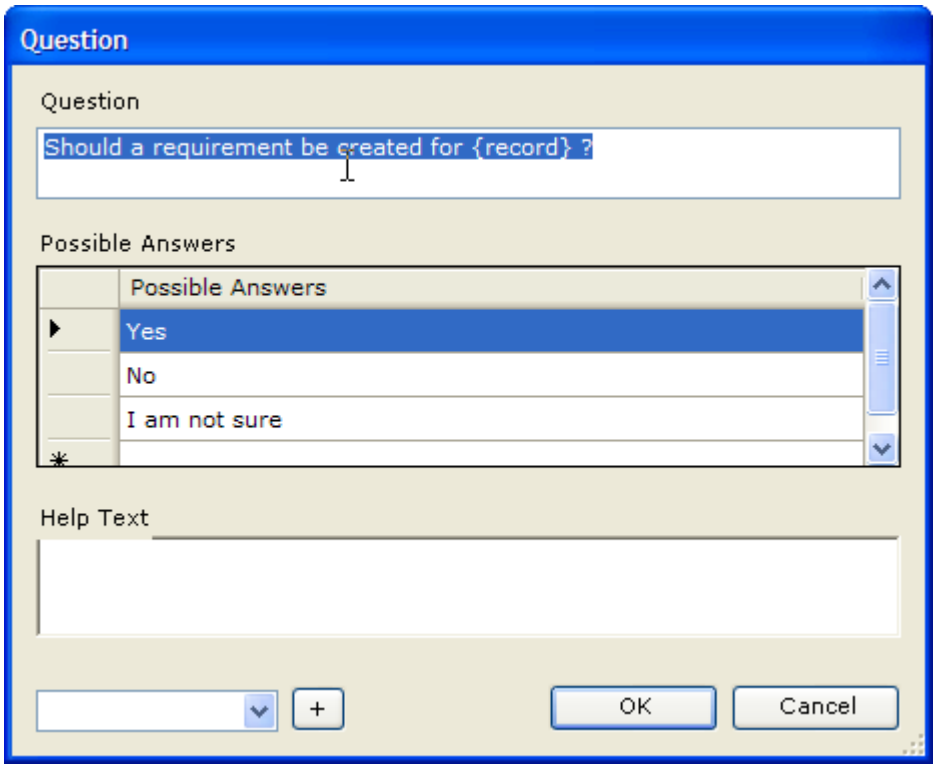
Note:

- *The variable {system} can be embedded in the question.*
- *All available variables are listed in the bottom left combo box. Select one and click on + to insert them in a text field.*

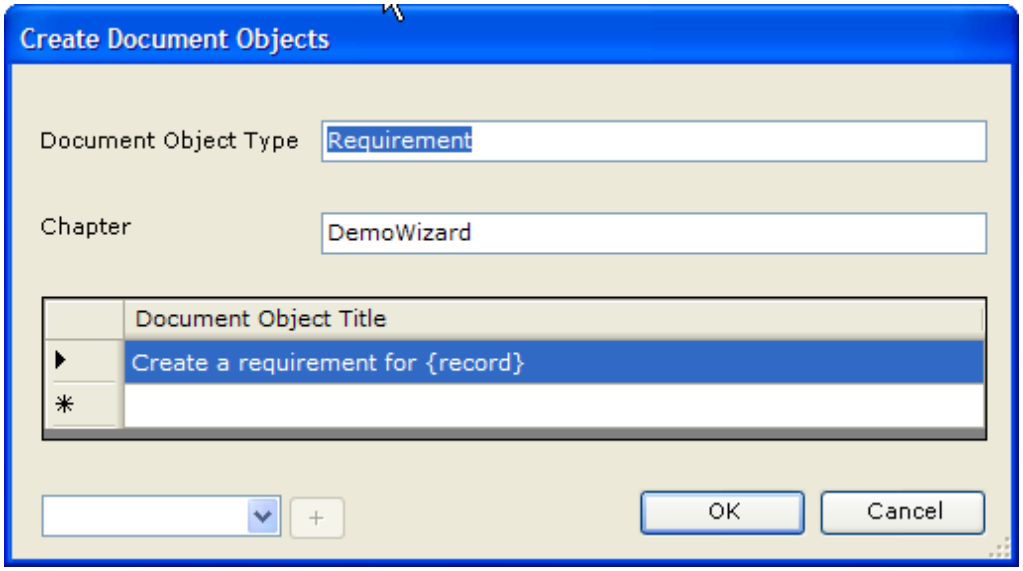
4. A loop is started with *Start of Iteration*. The wizard will iterate through the entries in the list {records}. The current value of the list is passed to the variable {record} and can be used within the iteration.



5. In *Ask a Question*, the user may select between 3 choices.



6. Depending on the choice of the user, 3 different paths may be entered. We will follow the path “Yes”. This leads us to the step *Create Document Objects* which for each record will create a Document Object of Type Requirement.



7. When done, the iteration will start from the beginning for the next value of {record} until all items in the list {records} have been handled.

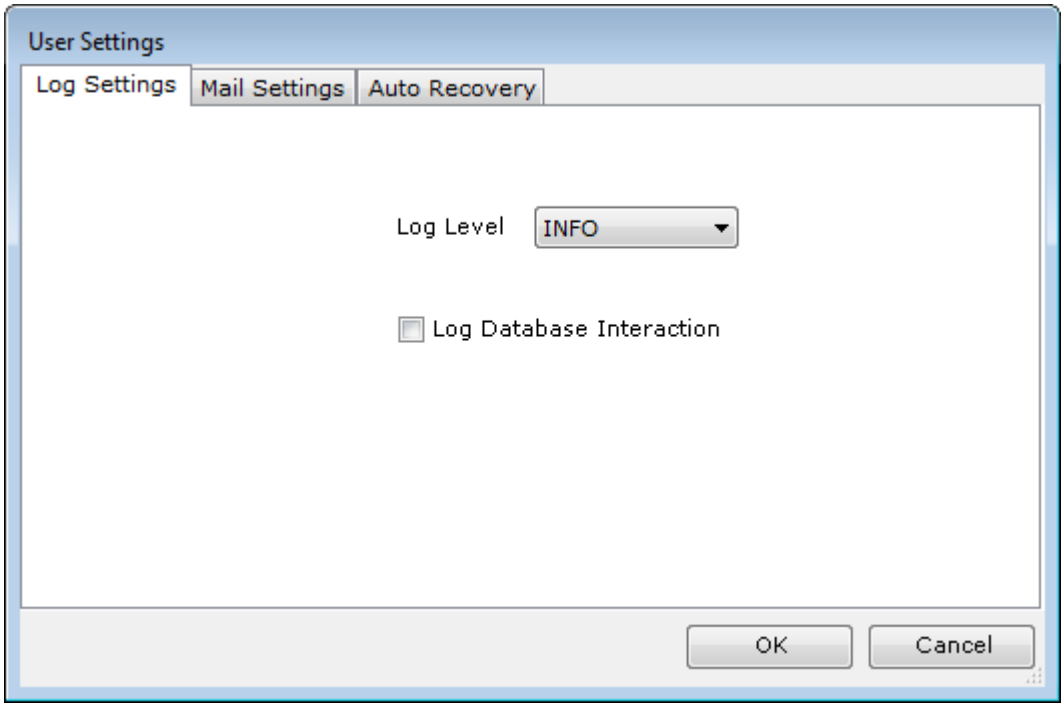
8. When all {records} have been handled, the wizard reaches the step *End* which displays some information to the user and ends the execution of the wizard.

The step *Select Objects* (which was not part of the demo wizard) could be used within a similar flow to ask the user to point to existing Document Objects which are objective evidence for the question of the step.

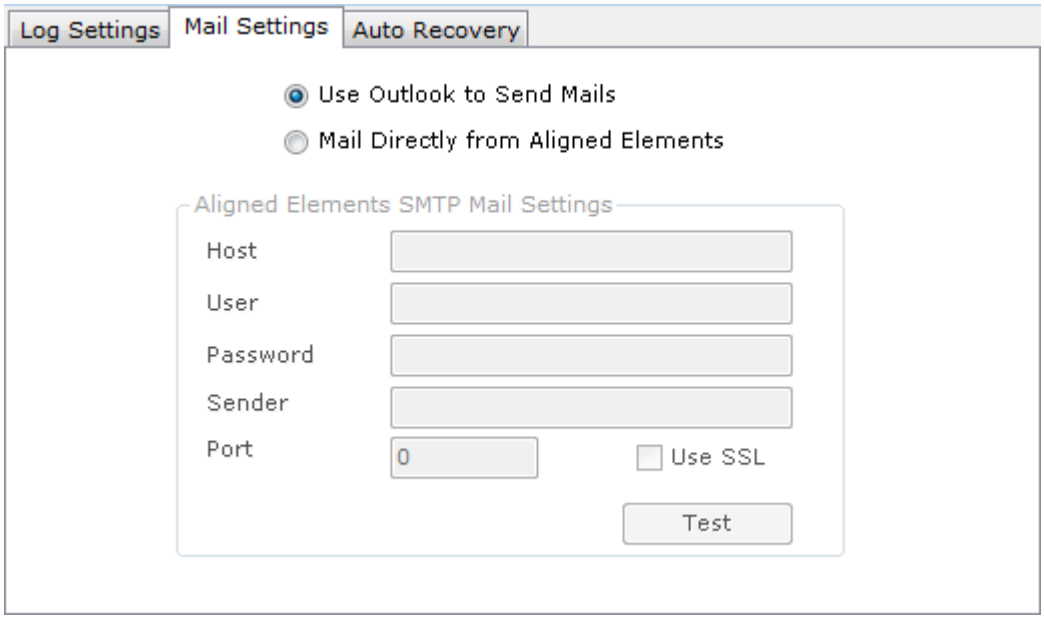
6.4. User Settings

Start with:

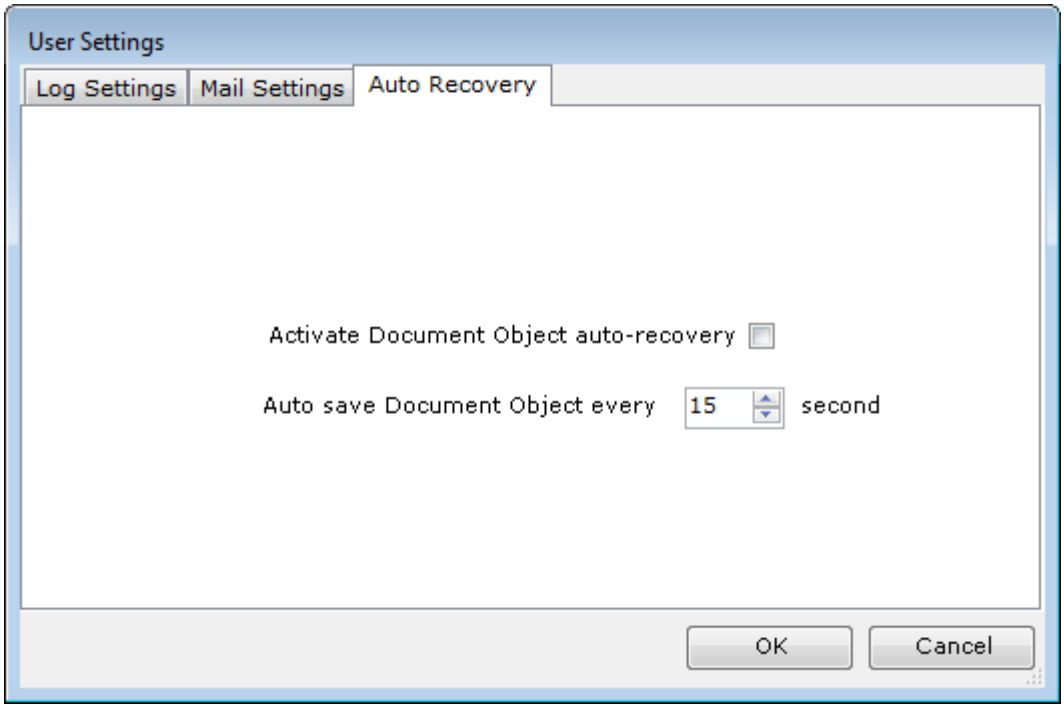
1. Setup your log settings. The default is to use the log level INFO and to NOT log database interaction. Changing these options will have a considerable impact on performance but can sometimes be requested by your Aligned representative on product support matters.



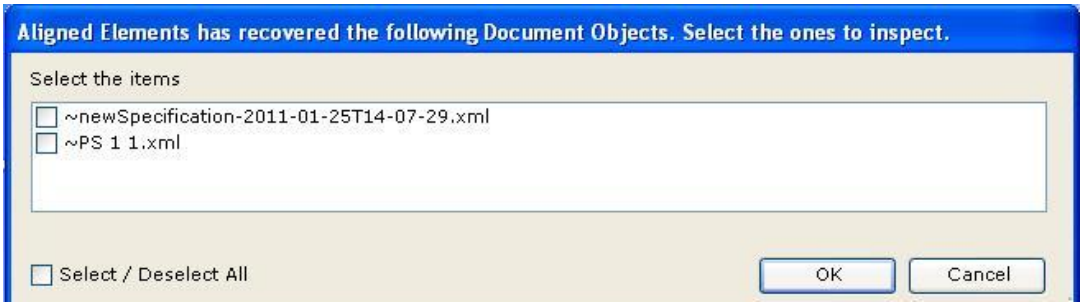
2. Settings to send mail to get support. Either your Microsoft Outlook mail client is used or you may mail directly from Aligned Elements in which case you have to configure the SMTP settings. User and password only has to be entered if your mail server requires authentication. The SMTP Server is a name on the form *mail.yourcompany.com*.



3. Activating auto-recovery of Document Objects implies that an intermediate data file is regularly stored for Document Objects that are opened in a Document Object Form.



If Aligned Elements should crash, these recovery files are displayed at startup



The first entry indicates a specification that was created and modified but never saved and therefore has no assigned ID. When this specification gets recovered, it is assigned a new ID.

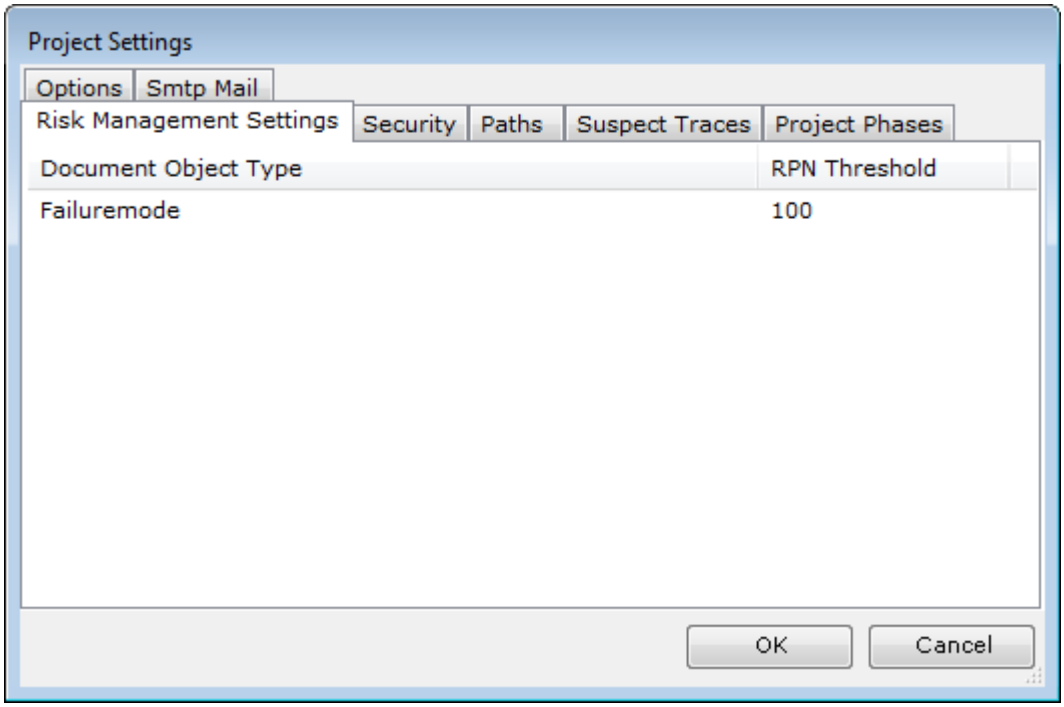
The second entry indicates a specification with the ID PS 1 rev 1. When this specification is recovered it is assigned the same ID but a new revision.

The user has the option to recover the last stored changes from these recovery files. Note that only attribute data is recovered (not traces).

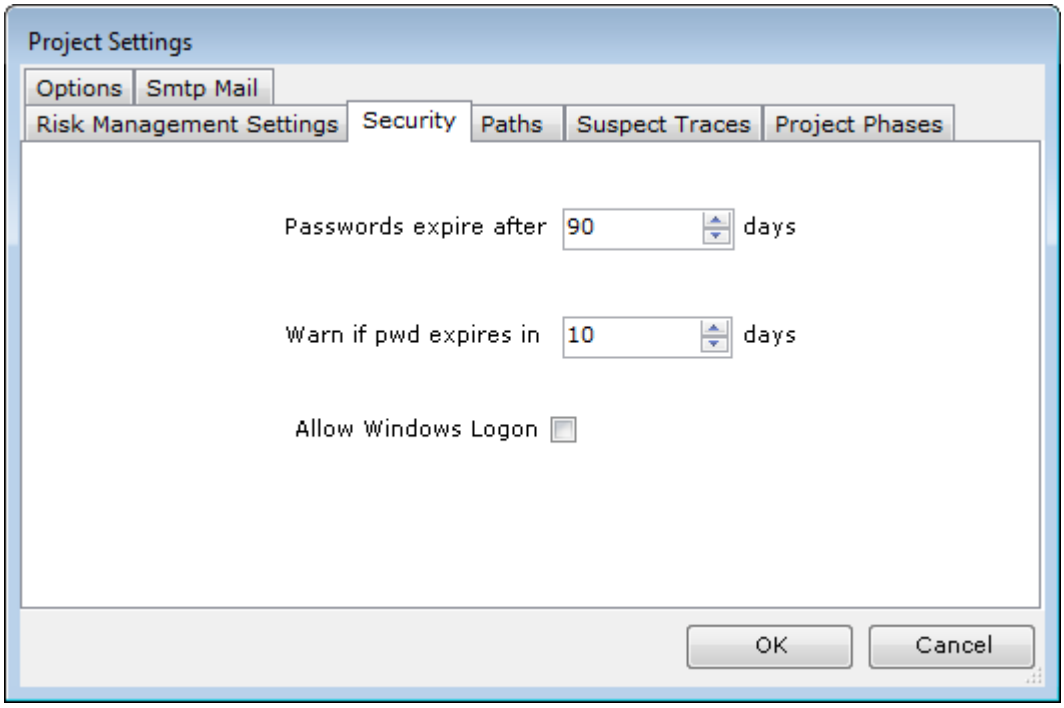
6.5. Project Settings

The project settings contain common settings for the project which might change over the project duration:

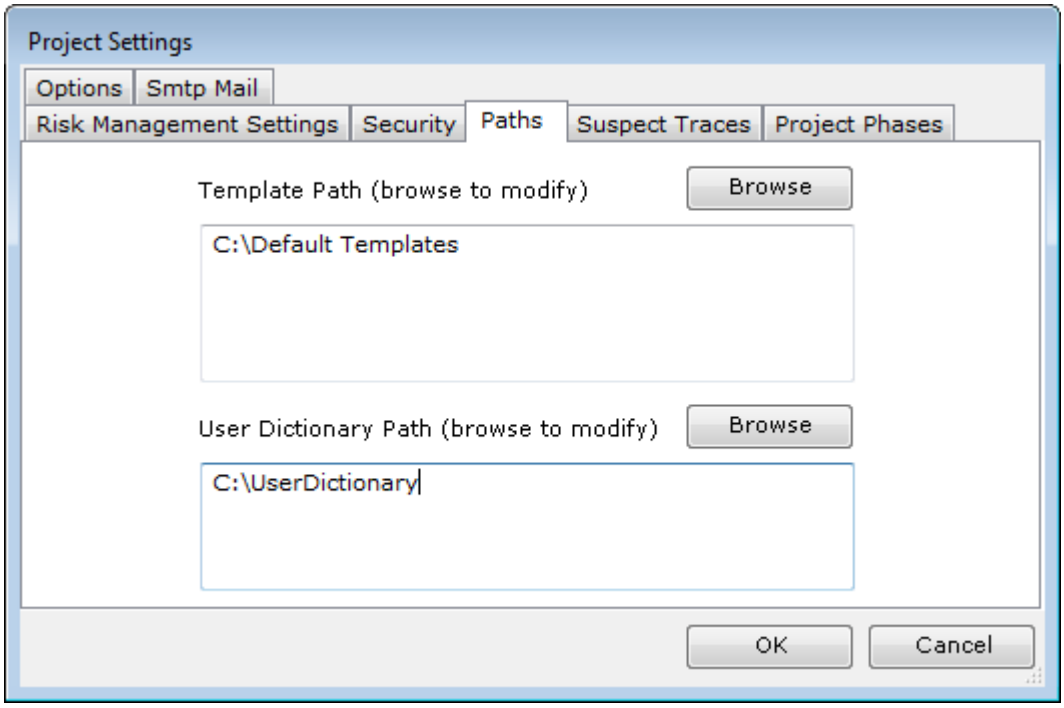
1. Risk Management Settings displays the RPN threshold for all risks. This threshold is defined in the associated risk rvt template (e.g. in the FailureMode.rvt file).



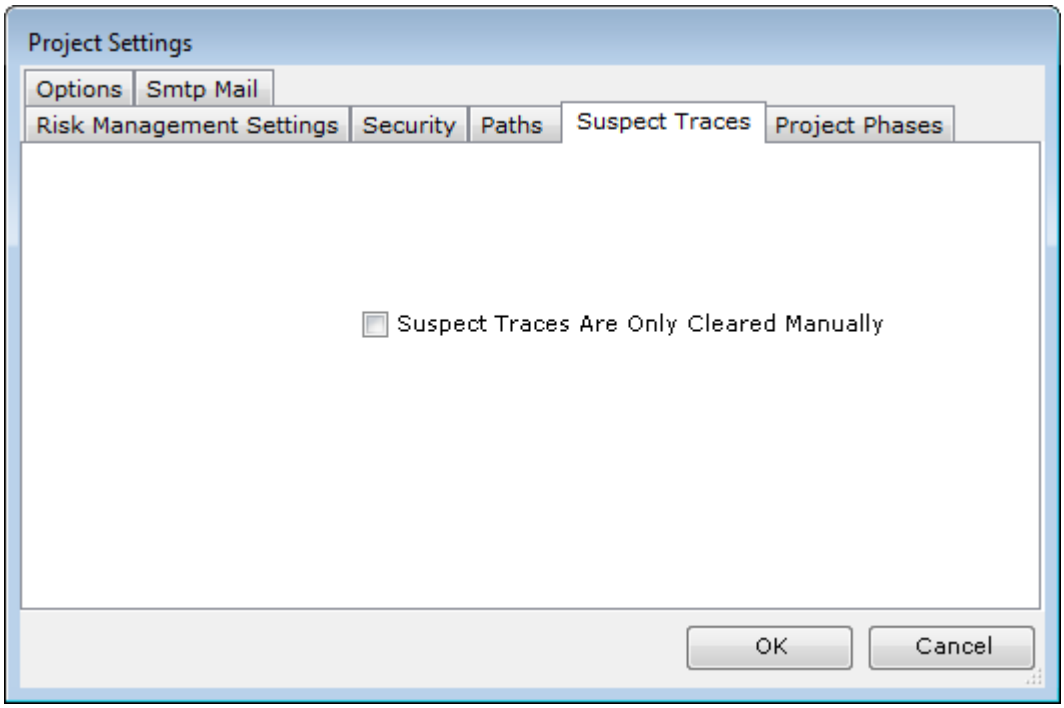
2. Expiration of password. Allows settings for when the password expires due to password aging when the password has to select a new password.



3. Project specific path to the Project Templates (see 6.7).

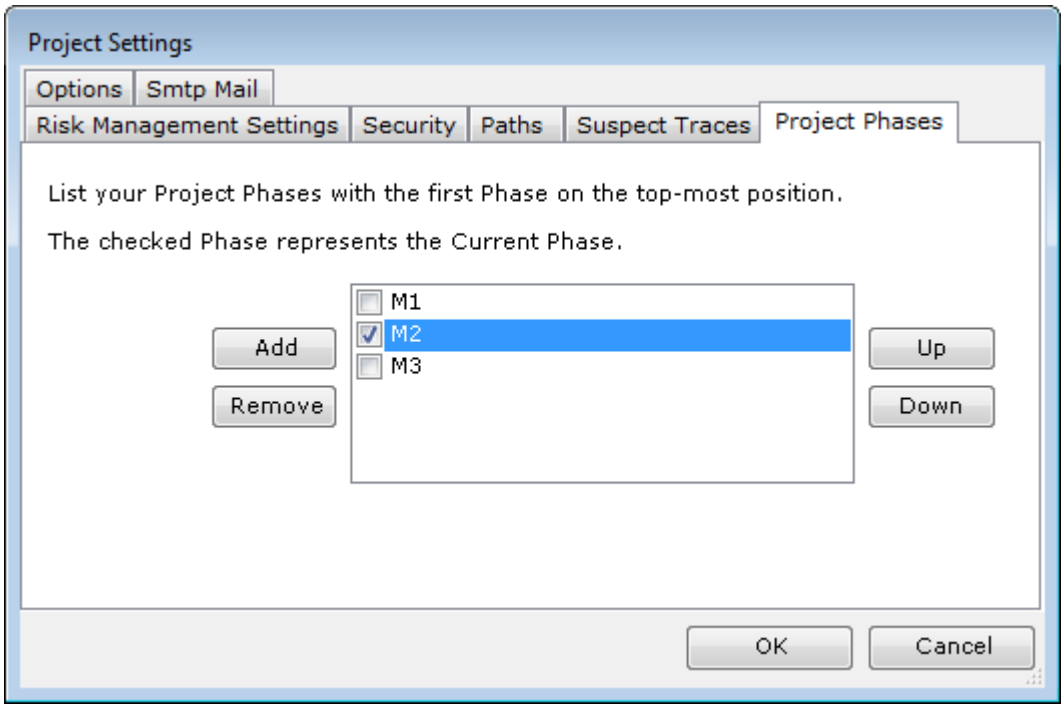


4. Suspect Trace



If you want to override the automatic clearance of Suspect Traces, tick the check box on this tab page.

5. Setting up and modifying Project Phases.



In order to compare the status of a concrete Delivery and the status that the QMS specifies for a certain Project Phase, Aligned Elements needs information about

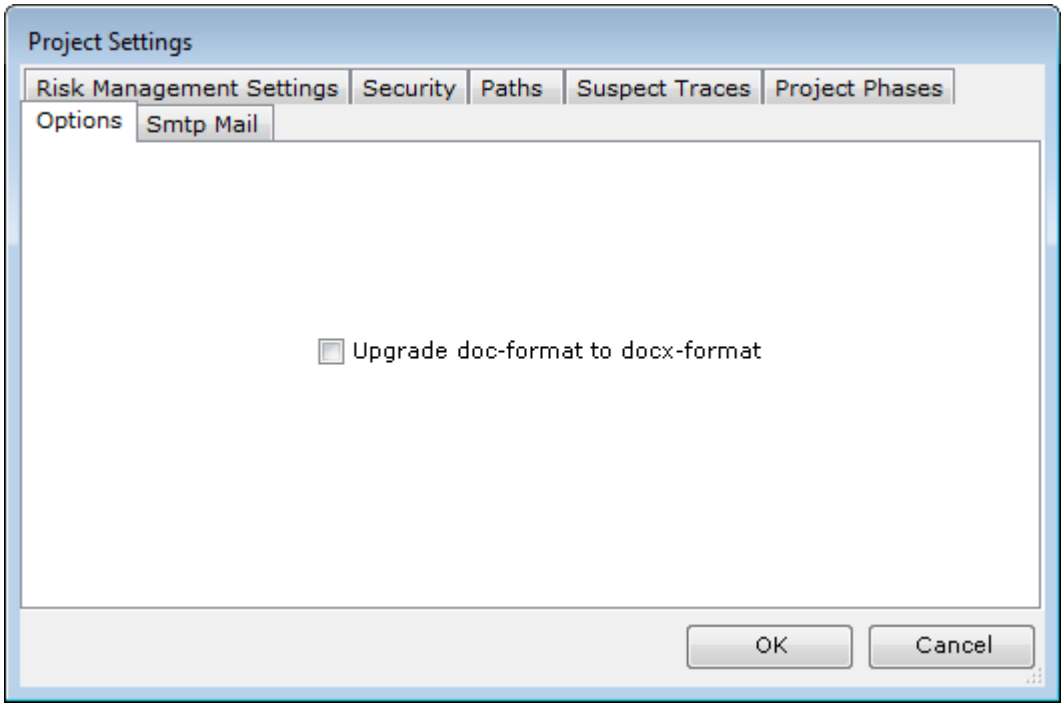
- The name and the order of the Project Phases according to the QMS.

- The name of the current Project Phase.

  Add the names of the Project Phases according to your QMS and arrange the phases in falling order.

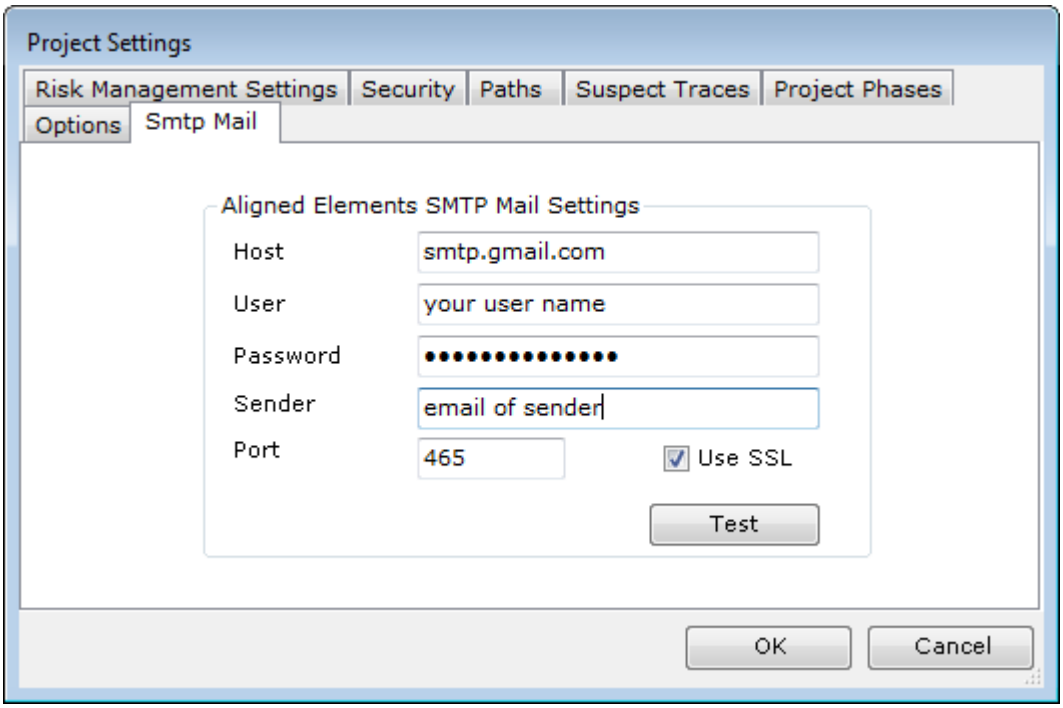
  Use the check box to declare the current Project Phase.

6. Options



   Check this checkbox to automatically (user is prompted) upgrade of .doc (Word 2003/2007 and earlier) to .docx (Word 2007 and later) when opening a Word document in a File Document Object.

7. Smtp Mail



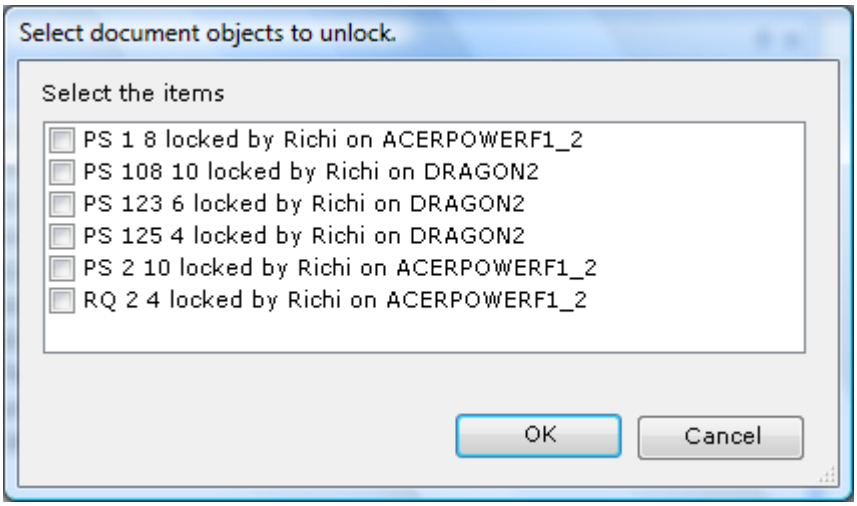
The values are applied as:

- Host – The smtp server address (e.g. smtp.gmail.com)
- User – An email address that has an account on the server
- Password – The password matching the User
- Sender – The name you want to appear as sender in the email
- Port – The port used (e.g. 465 for SSL)

Use the Test button to check if an email can be sent.

6.6. Unlocking Objects

As long as a document object is displayed in a Document Object Form, it is locked by the user that is currently modifying it. The document object is unlocked when the user either cancels the Document Object Form or commits the object. There exist occasions when document objects may remain locked, e.g. after a computer crash. The ***Unlock Objects*** function under the ***Project Menu*** offers a possibility to release individual locks on selected objects.



Note! Unlocking an object that a user is currently working on may result in an exception when the user tries to commit the locked object. Therefore, make sure that the document objects you unlock are not currently used by any user.

6.7. Setting up Project Templates

There exist two sets of project templates:

- Definition of document object types including their attributes. These are xml files with the file extension *.rvt*. These files also contain the definition of the rules used to determine if any inconsistencies exist.
- Document templates used for the Microsoft Word integration. These files define how a Document Object is displayed and formatted in Microsoft Word. The Word templates for the trace tables and for the revision history also belong to this set of templates.

The following naming convention of the files is used:

- For each template for a document object type in the folder \<*YourTemplates*> the same name exists for the Microsoft word templates with the file extension *.xml* in the folder \<*YourTemplates*>*RTFTemplates.*
- The revision history template is called: \<YourTemplates>\RTFTemplates\RevisionHistory.xml
- Only trace table templates exist in the folder \<*YourTemplates*>*TraceTemplates*

6.7.1. Changing templates for an existing project

Template changes are only detected at project load. If any modifications are detected, Aligned Elements will automatically update the document objects to match the new template changes, e.g. remove an attribute or add a column in a table. This will result in a new revision for all affected document objects. During this process the project may only be loaded by one single user and this user must have Project Administration rights.

6.7.2. Defining Document Object Types

You can configure the following items:

- Attributes
- Allow to generate other document objects from this object
- Allow to execute e.g. Test Cases.
- Validation rules to show any inconsistencies

Note: For a full xml schema of all possible configurations, please contact support@aligned.ch*.*

Here are some examples for different types of attributes:

- String attribute:
```
<StringAttribute Name="Description" />
```
- Rich Text attribute:
```
<RichTextAttribute Name="Description" ValueIfEmpty="Intentionally Left Blank">
<Template/>
  </RichTextAttribute>
```
- Integer Range attribute:
```
<IntRangeAttribute Name="Priority" MinValue="1" MaxValue="10"/>
```
- Enumeration attribute:
```
<EnumAttribute Name="Priority" >
        <Items DefaultItem="Low">
          <Item>High</Item>
          <Item>Middle</Item>
          <Item>Low</Item>
        </Items>
</EnumAttribute>
```
- User Enumeration attribute:
```
<EnumUserAttribute Name="AssignedToUser" />
```
- Multiselect attribute:
```
<MultiSelectAttribute Name="Multi">
      <Items>
        <Item value="One" selected="true"/>
        <Item value="Two" selected="false"/>
        <Item value="Two and a half" selected="false"/>
      </Items>
    </MultiSelectAttribute>
```
- Array Attribute:
```
<ArrayAttribute Name="ObjectsInFile" />
```

- File attribute:
  <FileAttribute Name="File" />

- Date Time attribute:
  <DateTimeAttribute Name="DueDate" ShowTime="false" />

- Table attribute:
```
<TableAttribute Name="TestInstructions" ContainsRichText="true" ValueIfEmpty ="-">
    <Columns>
      <Column>Stimuli</Column>
      <Column>ExpectedBehaviour</Column>
    </Columns>
</TableAttribute>
```

Attributes are displayed in the ***Document Object Form*** (see 2.6) in the order they appear in the template file. The ***Document Object Form*** has a fixed number of columns (8) and a flexible number of rows. When all columns are full for a row, the attribute will be placed on the next row. The row has the height of the highest control within the row. You may use the following settings for any type of attribute to control the layout:

- **ColumnSpan**
  a value between 1 – 8, where 8 is the full with of the document object form

- **CanGrow**
  can be true or false and if true, the control will adapt to display the full content. If false, a scroll bar will appear to allow the user to see the full content.

- **Height**
  the height of the control in pixels. A normal 1 row text box is usually 45 pixels high.

- **TopPadding**
  space above the control in pixels

- **BottomPadding**
  space below the control in pixels

- **LeftPadding**
  space left of the control in pixels

- **RightPadding**
  space right of the control in pixels

An example for 3 string attributes could be:

```
<StringAttribute Name="Description" ColumnSpan="3" CanGrow="true" Height="90"/>

<StringAttribute Name="Name" ColumnSpan="2" CanGrow="false" Height="45" TopPadding="4"
BottomPadding="4" LeftPadding="10" RightPadding="10"/>
```

```
<StringAttribute Name="Comment" ColumnSpan="6" CanGrow="false" Height="90"/>
```

This would result in 2 rows where Description and Name are placed on one row with the nominal height 90 (the row height could grow). Name has some padding to be positioned more in the middle. On the second row Comment would be placed in the first 6 columns:

Description	Name			
Comment				

You can optionally define a default value that is automatically added to empty fields (ValueIfEmpty). This is useful if you want to ensure that empty fields also in a word document, clearly states that they are empty.

For Rich Text Attributes, you can also optionally add a template:
`<Template>MyRtfTemplate.rtf</Template>`

And equivalent for Table columns:
`<Column Template="MyRtfTemplate.rtf">Stimuli</Column>`

The template is a file which you can create in word and save in the rich text format (rtf) in the same directory as your project templates. It allows you to e.g. set the default font for newly created attributes of this sort or to provide some default text in the field.

For Enum Attributes you may also define workflows by configuring the valid transitions between the values e.g.:

```
<EnumAttribute Name="Status">
  <Items DefaultItem="Open">
    <Item value="Open"/>
    <Item value ="Duplicate"/>
    <Item value ="Misunderstood"/>
    <Item value ="Closed"/>
  </Items>
  <Workflow>
    <Transition Value="Open" NextValue ="Duplicate">
        <Conditions>
                <TracedToRule ToTraceTypeName="Requirement"/>
         </Conditions>
    </Transition>
    <Transition Value="Open" NextValue ="Misunderstood"/>
    <Transition Value="Open" NextValue ="Closed">
        <Action Action="Sign"/>
        <Action Action="Email" ActionDataId="mail123"/>
     </Transition>
     <Transition Value="Duplicate" NextValue ="Open"/>
    <Transition Value="Misunderstood" NextValue ="Open"/>
    <Transition Value="Closed" NextValue ="Open"/>
    <ActionDatas>
```

```
        <EmailData Id="mail123" NotifyUsersInAttribute="AssignedTo">
          <UserGroupToNotify>Administrator</UserGroupToNotify>
          <UserGroupToNotify>Tester</UserGroupToNotify>
        </EmailData>
      </ActionDatas>
  </Workflow>
</EnumAttribute>
```

There are a number of workflow options available:

- **Conditions**
  Use this conditions to validate inconsistencies as part of the transition. If the inconsistencies are found, then the user is not allowed to make the transition change.

- **Signatures**
  generate an electronic signature round when a transition takes place to formally sign-off on the transition (see section 3.13).

- **Send Emails**
  send an automatic email when a transition takes place to designated stake holders to keep them informed on the change that just happened.

If you change add, remove or rename any attributes for an existing project, you will be asked if you want to update all affected objects during the loading of the project. If the change is intentional, respond yes, otherwise no and revert your changes to the template (to avoid the same question the next time you load the project).

If you responded yes for all affected document objects of this type a new revision will be created containing the modified attributes in the following manner:

- If an attribute is removed, the attribute will be removed from the new revision.

- If an attribute is added, it will also be added to the new revision.

- If a table attribute receives a change to the columns, the new revision will receive this change as well.

It is important to understand that old revisions are not affected of a template change (you will see the difference when you compare revisions)!

It is important to understand that old revisions are not affected of a template change (you will see the difference when you compare revisions)!

6.7.3. Configuring Validation Rules

In the template for the Document Object Type you can also define the possible validation rules that should apply to the object. The available rules and their parameters are:

The ”Traced to” - rule enforces the relationship between the parent object and at least one child object. E.g. A requirement should at least have one trace to a specification:

```
<TracedToRule ToTraceTypeName="Specification"/>
```

The ”Illegal Trace”- rule signalizes if there exist a forbidden relationship between the parent object and at least one child object. E.g. A requirement may not trace to a test case:

```
<IllegalTraceToRule IllegalTraceToTypeName="TestCase"/>
```

The “Not Reviewed” - rule enforces that the document object has been reviewed:

```
<NotReviewedRule ReviewTypeName="Review"/>
```

The “Open Issue” - rule checks if there parent object has any still open issues :

```
<HasOpenIssueRule TypeNameIssue="Issue" OpenAttributeName="Status">
      <ExpectedAttributeValue>Closed</ExpectedAttributeValue>
      <ExpectedAttributeValue>Duplicate</ExpectedAttributeValue>
      <ExpectedAttributeValue>Misunderstood</ExpectedAttributeValue>
</HasOpenIssueRule>
```

The “Suspect Trace” - rule, decides if the traces to the child objects should be set suspect if the parent object is changed to a new revision:

```
<SuspectTraceRule/>
```

The “Risk Not Mitigated”- rule is implemented in the Failure Mode and checks if the risk probability number for the hazard after mitigation is above the treashold:

```
<RiskNotMitigatedRule RiskTypeName="Hazard" MitigationTypeName="Mitigation"
StopAtFirstInconsistency="false" AnyMitigationClearsSeverityInconsistency="true"/>
```

The “Harm Not Mitigated” - rule, is the equivalent for Risk Anylsis and checks the probaility and severity for the combination on the ProbabilityOfHarm object before and after measures:

```
<HarmNotMitigatedRule ProbabilityOfHarmTypeName="ProbabilityOfHarm" HarmTypeName="Harm"
MeasureTypeName="Measure"/>
```

The “Consistent Classification” – rule, can be used in systems where a Risk Analysis is used. It checks that the Safety classification for e.g. a Sw Item is consistent with the Risk Analysis. For Sw Items with the lowest Safety Classification , i.e. ‘A’, there may optionally be a trace to a NoCause to justify that the Item is not implying any Harms in the system:

```
<HasConsistentClassification AttributeName="SafetyClassification" TypeNameCause="Cause"
TypeNameRiskAnalysis="RiskAnalysis" TypeNameNoCause="NoCause">
      <CheckTracesOfType>
        <Trace TypeName="SoftwareItem"/>
        <Trace TypeName="SoftwareUnit"/>
        <Trace TypeName="SOUP"/>
      </CheckTracesOfType>
      <ClassificationMapping>
        <Classification Value="A" MaxSeverity="1"/>
        <Classification Value="B" MaxSeverity="3"/>
        <Classification Value="C" MaxSeverity="5"/>
      </ClassificationMapping>
    </HasConsistentClassification>
```

The “Attribute Value”- rule allows to consider an object inconsitent if an attribute doesn’t hold a certain value, e.g. an executed test case was not passed:

```
<AttributeValueRule AttributeName="Status">
    <ExpectedValue>Closed</ExpectedValue>
    <ExpectedValue>Duplicate</ExpectedValue>
    <ExpectedValue>Misunderstood</ExpectedValue>
</AttributeValueRule>
```

The “Related Attribute Value”-rule checks that the combination of 2 attribute values in an object are consistent. This rule can also be enforced before saving any objects (the user is then

prompted with the inconsistency). Here an example from a Measure where the type of Measure should match the probability reduction:

```
<RelatedAttributeValueRule AttributeNameA="Type" AttributeNameB="ProbabilityReduction"
EvaluateAtCommit="true">
      <ValueMap ValueA="Design">
        <ValidValue ValueB="4"/>
      </ValueMap>
      <ValueMap ValueA="Protective">
        <ValidValue ValueB="3"/>
      </ValueMap>
      <ValueMap ValueA="Warning">
        <ValidValue ValueB="2"/>
      </ValueMap>
      <ValueMap ValueA="Information">
        <ValidValue ValueB="1"/>
      </ValueMap>
    </RelatedAttributeValueRule>
```

To validate if all document objects in a file are up to date (have the most current revision), you can add the rule below:

```
<ObjectsInFileUpToDateRule AttributeName="ObjectsInFile"/>
```

To ensure that a certain document object type has been added to a file, use the following rule:

```
<ObjectInFileRule FileTypeName="File" AttributeName="ObjectsInFile"/>
```

To check if a date has been passed or not, use the DueDate rule:

```
<DateOverdueRule AttributeName="DueDate" WarnDaysInAdvance="1"/>
```

This validation rule is useful in combination with other validation rules which can be linked through the usage of the Combine Rule.

Below is an example of a combination of trace rules to ensure that the document object *either* “has a trace to a specification” OR “to a use case”. If one of the rules are fullfilled then no inconsistencies are mentioned:

```
<CombinedRules Combination="OR">
   <TracedToRule ToTraceTypeName="Specification" />
   <TracedToRule ToTraceTypeName="UseCase" />
</CombinedRules>
```

It is also possible to create and combine conditional rules.

```
<ConditionalRule>
      <Condition>
            <AttributeValueRule AttributeName="RequirementType">
                  <ExpectedValue>Software</ExpectedValue>
            </AttributeValueRule>
      <Condition>
      <EvaluateIfConditionIsMet>
            <TracedToRule ToTraceTypeName="Specification" />
      </EvaluateIfConditionIsMet>
      <EvaluateIfConditionIsNotMet>
            <TracedToRule ToTraceTypeName="TestCase" />
      <EvaluateIfConditionIsNotMet>
</ConditionalRule>
```

The rule above evaluates the AttributeValueRule om the condition clause and then generates inconsistencies based the outcome of the condition. If the attribute “RequirementType” has the value “Software”, the value rule MissingTrace to specification is evaluated and generates an

inconsistency if there is no specification trace. If the attribute value is not “Software”, then the MissingTrace to UseCase is evaluated.

The conditional rule can use combination rules and nested conditional rules in any of the clauses.

To validate objects based on states of traced objects the following validation rule can be used:

```
<ValidationOnTracesRule TypeName="Specification">
      <RulesToCheck>
            <TracedToRule ToTraceTypeName="Requirement" />
      </RulesToCheck>
</ValidationOnTracesRule>
```

If the above rule is applied to e.g. the type requirements, a requirement with a trace to a specification with a trace back to a requirement would generate an inconsistency for the first requirement.

Consistency Coverage parameters in Validation Rule definitions

1) To exclude a validation rule from the consistency calculation, use the `ExcludeFromCoverage` attribute (false by default.

2) To set the coverage weight for a validation rule, use the `CoverageWeight` attribute to set a weight (decimal value).

6.7.4. Special Template Sections

The RPN Threshold, the severity limit and the calculation formula (using normal C# syntax) is defined in a seprate section below the Compulsory Traces section. For 3 intervals of the RPN threshold, use the CodeThreshold section instead of the attribute RPNThreshold. To allow to Display a Risk Summary, add a RPNTable definition which describes how Severity, Probability and Visibility should be displayed on the X and Y axis:

```
<RPNCalculation RPNThreshold="100" SeverityLimit="8">
  <Code FunctionName="GetRPN">
    public int GetRPN(int severity, int probability, int visibility)
    {
      return severity * probability * visibility;
    }
  </Code>
  <CodeThreshold FunctionName="GetThreshold">
    public int GetThreshold(int severity, int probability, int visibility)
    {
      int acceptable = 0;
      int ALARP = 1;
      int inAcceptable = 2;
      int rpn = severity * probability * visibility;

      if (rpn &lt; 80)
      {
          return acceptable;
      }
      else if (rpn &lt; 100)
      {
        return ALARP;
```

```
      }
      return inAcceptable;
    }
  </CodeThreshold>
  <RPNTable Description="Risk Probability Summary">
    <XAxis Description="Probability x Visibility">
      <Item Probability="1" Visibility="1"/>
      <Item Probability="2" Visibility="2"/>
      <Item Probability="3" Visibility="3"/>
      <Item Probability="4" Visibility="4"/>
      <Item Probability="5" Visibility="5"/>
      <Item Probability="6" Visibility="6"/>
      <Item Probability="7" Visibility="7"/>
      <Item Probability="8" Visibility="8"/>
      <Item Probability="9" Visibility="9"/>
    </XAxis>
    <YAxis Description="Severity">
      <Item Severity="1" />
      <Item Severity="2" />
      <Item Severity="3" />
      <Item Severity="4" />
      <Item Severity="5" />
      <Item Severity="6" />
      <Item Severity="7" />
      <Item Severity="8" />
      <Item Severity="9" />
    </YAxis>
  </RPNTable>
</RPNCalculation>
```

To set up an interface to either Trac or Jira bug trackers a special section can be added to a template directly after the TypeInfo.

To connect to Trac, define `AssemblyName="Elements.TracConnect.dll"`.
To connect to a Jira system define `AssemblyName="Elements.JiraConnect.dll"`.

The IssueProxy has 4 sections:

- Properties, these define the specific communication properties for the chosen Assembly
- AttributeMap, Map the standard attributes, Description, Priority, AssignedTo, DueDate and Status to the used names in the interfaced bug-tracker.
- StatusMap, list the used status names and define if the status is considered open or closed.
- UserMap, map the user names between the 2 systems. If they are the same, then you can omit this section.

Here is an example for Trac:

```
<IssueProxy AssemblyName="Elements.TracConnect.dll" IssueBaseUrl="https://www.hosted-
projects.com/trac/aligned/TracConnect/ticket/" DefaultOwner="somebody">
    <Properties>
      <Property Name="url" Value="https://www.hosted-
projects.com/trac/aligned/TracConnect/login/xmlrpc"/>
      <Property Name="preauthenticate" Value="true"/>
      <Property Name="defaultComponent" Value="component1"/>
```

```
      <Property Name="defaultType" Value="defect"/>
      <Property Name="defaultQuery" Value="status=new|assigned|reopened"/>
      <Property Name="keepAlive" Value="false"/>
    </Properties>
    <AttributeMap>
      <Map AttributeName="Description" ProxyAttribute="Description"/>
      <Map AttributeName="Priority" ProxyAttribute="Priority"/>
      <Map AttributeName="Owner" ProxyAttribute="AssignedTo"/>
      <Map AttributeName="DueDate" ProxyAttribute="DueDate"/>
      <Map AttributeName="Status" ProxyAttribute="Status"/>
    </AttributeMap>
    <StatusMap>
      <Map Status="new" IsOpen="true"/>
      <Map Status="closed" IsOpen="false"/>
      <Map Status="reopened" IsOpen="true"/>
      <Map Status="not initialized" IsOpen="true"/>
    </StatusMap>
    <UserMap>
      <Map ElementsUser="Bo" ProxyUser="bb"/>
      <Map ElementsUser="Joe" ProxyUser="jj"/>
    </UserMap>
  </IssueProxy>
```

And here an example for Jira:

```
<IssueProxy AssemblyName="Elements.JiraConnect.dll"
IssueBaseUrl="http://jira.atlassian.com/browse/" DefaultOwner="somebody">
    <Properties>
      <Property Name="url" Value="http://jira.atlassian.com/rpc/soap/jirasoapservice-
v2"/>
      <Property Name="preauthenticate" Value="true"/>
      <Property Name="defaultComponent" Value="GUI"/>
      <Property Name="defaultFilter" Value="Test Project Open"/>
      <Property Name="jiraProject" Value="TST"/>
      <Property Name="defaultIssueType" Value="Task"/>
    </Properties>
    <AttributeMap>
      <Map AttributeName="Description" ProxyAttribute="Description"/>
      <Map AttributeName="Priority" ProxyAttribute="Priority"/>
      <Map AttributeName="Assignee" ProxyAttribute="AssignedTo"/>
      <Map AttributeName="DueDate" ProxyAttribute="DueDate"/>
      <Map AttributeName="Status" ProxyAttribute="Status"/>
    </AttributeMap>
    <StatusMap>
      <Map Status="Open" IsOpen="true"/>
      <Map Status="In Progress" IsOpen="true"/>
      <Map Status="To be reviewed" IsOpen="false"/>
      <Map Status="Not Qualified" IsOpen="false"/>
    </StatusMap>
    <UserMap>
      <Map ElementsUser="Bo" ProxyUser="xmlrpctester"/>
      <Map ElementsUser="Joe" ProxyUser="soaptester"/>
    </UserMap>
  </IssueProxy>¨
```

When connecting to a url, you can optionally use a client certificate. The client certificate must be installed in your certificate store (use Microsoft Internet Explorer or Microsoft Management Console with the plug in for Certificates to manage your certificates). Use the following parameter to refer to the certificate using the display name:

```
<Property Name="certificateName" Value="My Client Certificate"/>
```

6.7.5. Mapping Projects to Template Files

Sometimes different document projects want to re-use templates but with slight modifications. To accomplish this an optional configuration file can be added to the template directory. The file name must be `ProjectMapping.xml` and the content may be according to the example below:

```
<?xml version="1.0" encoding="utf-8"?>
<ProjectMapping xmlns="urn:ProjectMapping.xsd">
  <Project name="ProjectOne">
    <Exclude typeName="Ticket"/>
    <MakeVisible typeName="Attachment"/>
    <MakeInvisible typeName="UseCase"/>
  </Project>
  <Project name="ProjectTwo">
    <MakeInvisible typeName="Specification"/>
  </Project>
</ProjectMapping>
```

The example above assumes that the Templates contains the types, Ticket, Attachment, UseCase where Ticket and UseCase are defined as `IsVisibleBook="true"` and Attachment as `IsVisibleBook="false"`.

For ProjectOne, the type Ticket will not be loaded at all, Attachment will be visible in the Project Explorer and UseCase will not be visible in the Project Explorer. For ProjectTwo, Specification will not be visible in the Project Explorer. For any other project using the same templates, all templates will be available having the visibility as defined directly in the rvt-templates.

In short, for any Project you may define any number of:

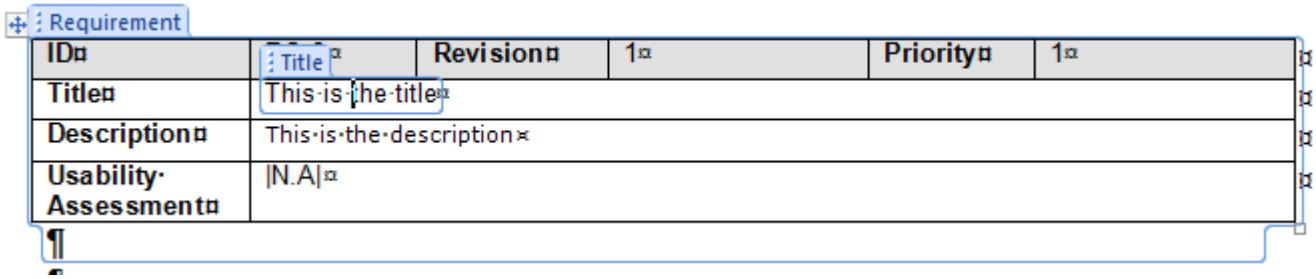
1. `Exclude,` Excluded templates, templates that are present in the Template directory but will not be considered for the named project.
2. `MakeVisible,` Templates which has the property `IsVisibleBook="false"` will for the named project be treated as `IsVisibleBook="true"`.
3. `MakeInvisible,` Templates which has the property `IsVisibleBook="true"` will for the named project be treated as `IsVisibleBook="false"`.

6.8. Defining Microsoft Word Templates

When dragging document objects into a Microsoft Word document, they are displayed in a definable way. This definition is done by writing small word documents. These „word templates“ contain place holder tags which are filled with the data from the document object, when it is inserted into a document. In this way it is made possible that the look of the different document object types matches the look of the document templates which your company uses. The preferred technology to support newer version of word is to use docx – templates see 6.8.1. To support older version of word, please refer to 6.8.2. Both types of templates can live next to each other to support e.g. the transition from .doc to .docx documents.

6.8.1. Defining Microsoft Word Docx -Templates

Docx-template makes use of Content Controls to maintain information about the data from Aligned Elements that resides in a word document. For a Requirement it may look like this:



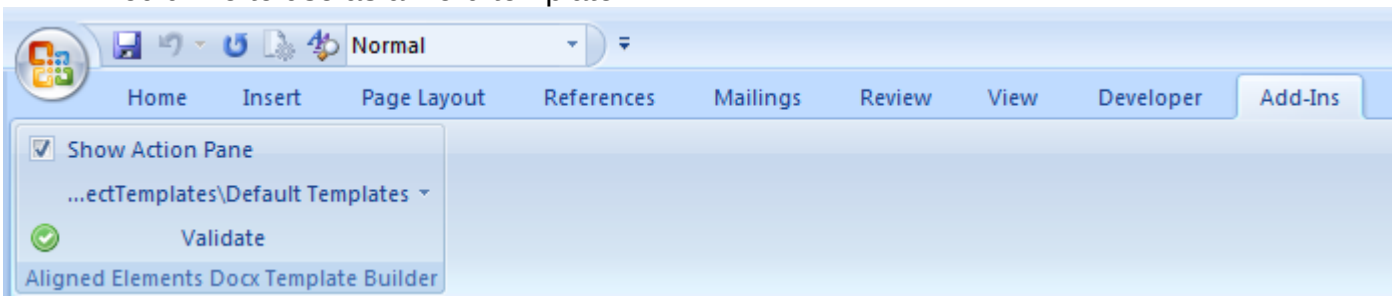
A requirement type (in our case Requirement) surrounds all data that should be displayed for the object. An attribute is contained in a nested content control.
Aligned Elements supports the following content control types:

1. Rich Text (for surrounding Content Controls, Rich text and table attributes, Traced Objects)
2. Text (for String Attributes)
3. Drop-down Lists (for Enum and Multi select attributes)
4. Date Picker (for DateTime attributes)

Defining a Simple Template using the Docx Template Builder

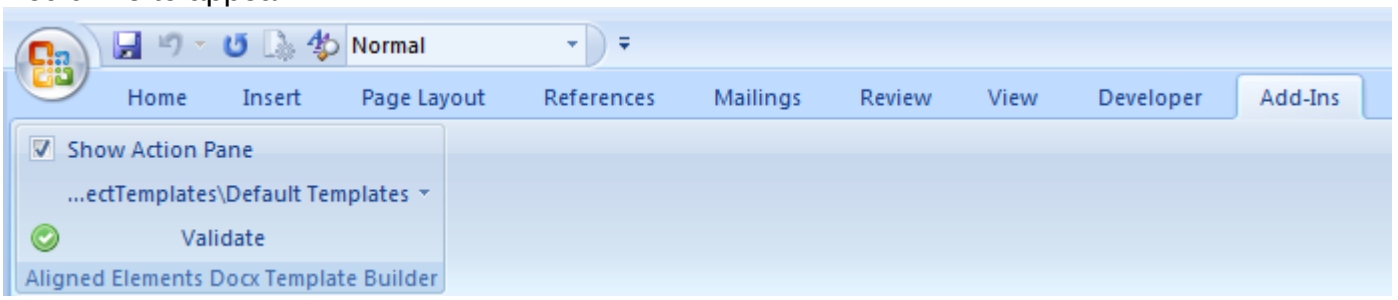
The Docx Template Builder can be requested from support@aligned.ch and is a Word-addin that simplifies the creation of docx-templates.

1. To enable the add-in, navigate to The Add-ins ribbon in word for any document that you would like to use as a word template.

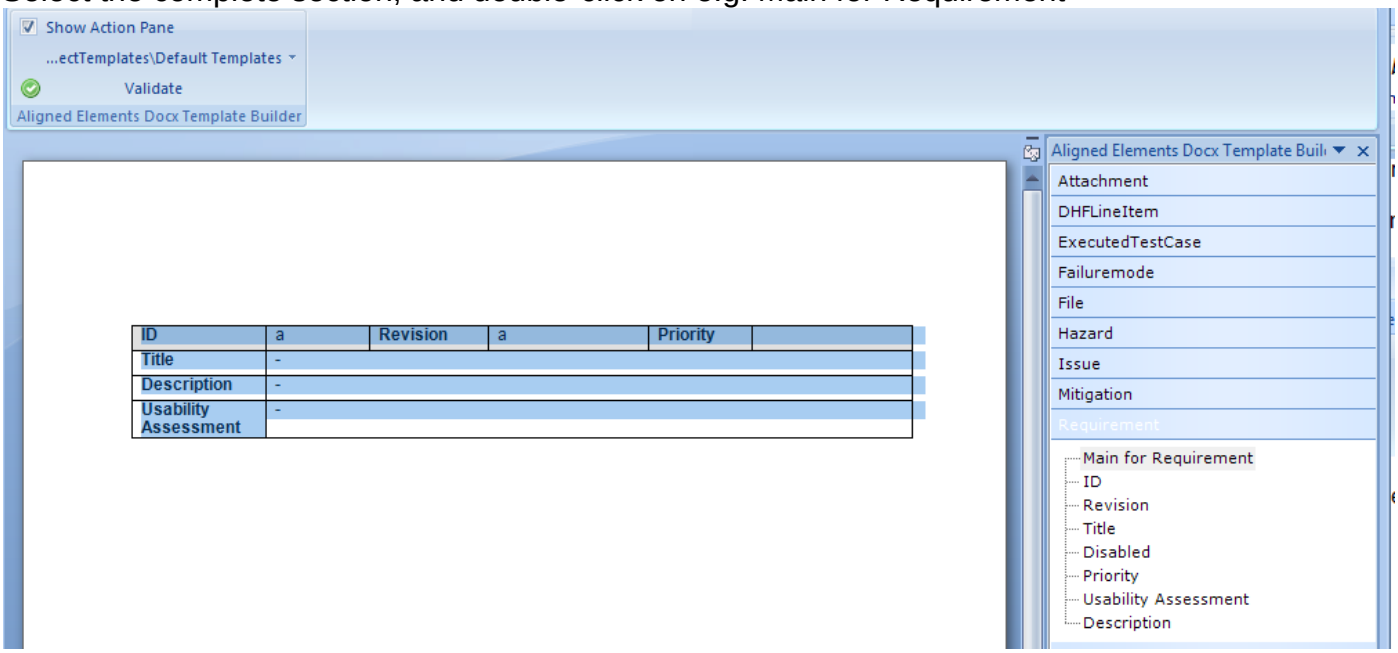


2. Check ***Show Action Pane***
3. Browse to your template directory. Now the templates are loaded and displayed in the Action Pane.

4. Insert a table (if you want the document object to be enclosed in a table) and the text you would like to appear



5. Select the complete section, and double-click on e.g. Main for Requirement

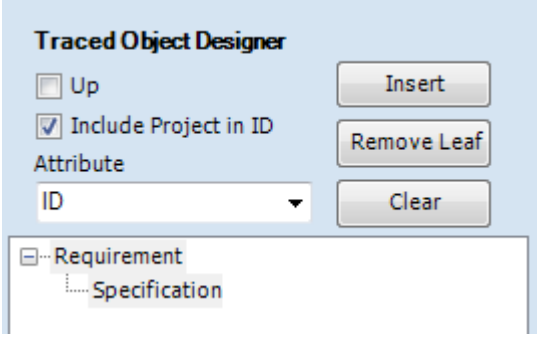


6. The table in the example above will now be enclosed in a content control
7. For each attribute that should be displayed, click on the location in the document (within the enclosing content control) and double-click on attribute name in the Action Pane, e.g. Title or Description. This causes one content control to be inserted per Attribute.
8. When all data entries are defined. Save the template and try it out in Aligned Elements.

Defining Templates Including Information from Traced Document Objects

Follow the example above to create a simple template
In our example we would like to include the Id's of all traced Specifications. To do this you need to Use the Traced Object Designed in the Action Pane.

1. Drag the ***Main for Requirement*** into the Traced Object Designer
2. Drag the ***Main for Specification*** into the Traced Object Designer
3. Select an Attribute to display, in our case we use the ID



4. Place the cursor in the document where the data should be displayed and click on ***Insert***
5. Repeat for all information that should be included in the template

Using Main Tags

You may create templates to display information other than Document Objects. The available options are listed under Main Tags:

Tag Name	Normal Use
TraceTable	To define trace tables. Make use of the Traced Object Designer to define the trace releations.
QueryTable	To define the template for Query result in table form.
RPNSummary	To define templates for RPNSummary
DHFIndexTable	To define the template for a DHFIndexTable
RevisionHistory	To define the template for the automatic Revision History
Chapter	To define templates for different chapter levels

Using Special Tags

Special tags can be used for any template for Document Objects and in trace tables. The available tags are:

Tag Name	Normal Use
ParentChapter	Will list the name of the chapter in which the document object resides.
Creator	Will list the user name of the createor of the document object.
ContainingFiles	Will list all file document objects in which the document object appears
CheckBox	Will display attribute data in the form of a check box where e.g. True is displayed as checked and False as not checked
Inconsistency	Will display information about an inconsistency type for a document object if present.
ContainedInReviews	Will display information on document objects contained in a review.

6.8.2. Defining Microsoft Word Xml -Templates

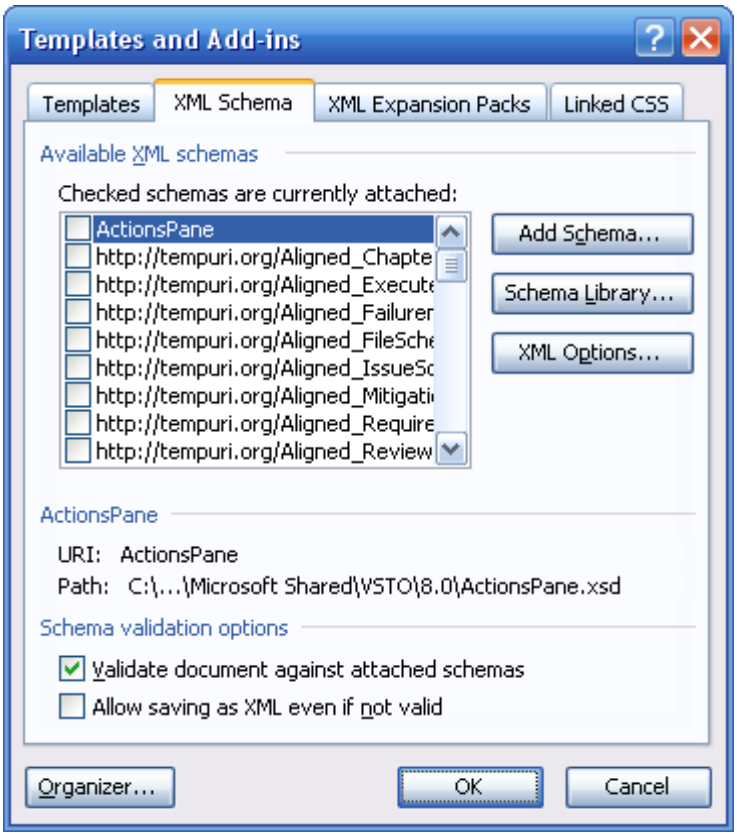
Note! Xml-Templates can only be used in .doc documents in Word 2003 or Word 2007. For use with higher versions of word, please refer to 6.8.1.

The role of schemas

When creating a word template, Microsoft Word has to know which fields are available for this specific template. For this a schema is attached to Microsoft word. It contains this information.

Attaching a Schema

In order to attach a certain schema, you select „Tools“, then „Templates and Add-Ins…“



Then you select the XML Schema tab, where you choose the „Add Schema…“-button. In the Browse Dialog you select the desired schema and then press ok. You then close The „Templates and Add-ins“-dialog.

Please note that the schema is not attached to a specific document, but it is made available to all documents loaded or created by this instance of Microsoft Word.

Modification of XML Schemas

Please ask the assistance of Aligned to do this.

Note: It is possible to use templates without having the corresponding schema, but you will then not be able to make changes to the template.

Creating the template:

In order to create a template for a document object type you create a new document and then activate the Task-pane (View and then Task-pane). On the top of the task-pane there is drop down list, where you select „XML Structure“.
You should now see the main xml tags of the document object types for which you attached the schema. If you do not see this, then you first need to attach a schema (see 0).

You can now start to design your template by writing text and using all the formatting options of word. After doing this, you click on the desired type of document object listed in „Choose an element to apply to your current selection“. The following prompt appears.

Please choose „Apply to Entire Document“. The whole template is now enclosed in the chosen tag.

Now click anywhere between the two tags, and the list of available xml tags will show. The list mainly consists of attributes of the document object for which you are creating a template. Now just insert the tags at the positions where you want the corresponding data to appear.

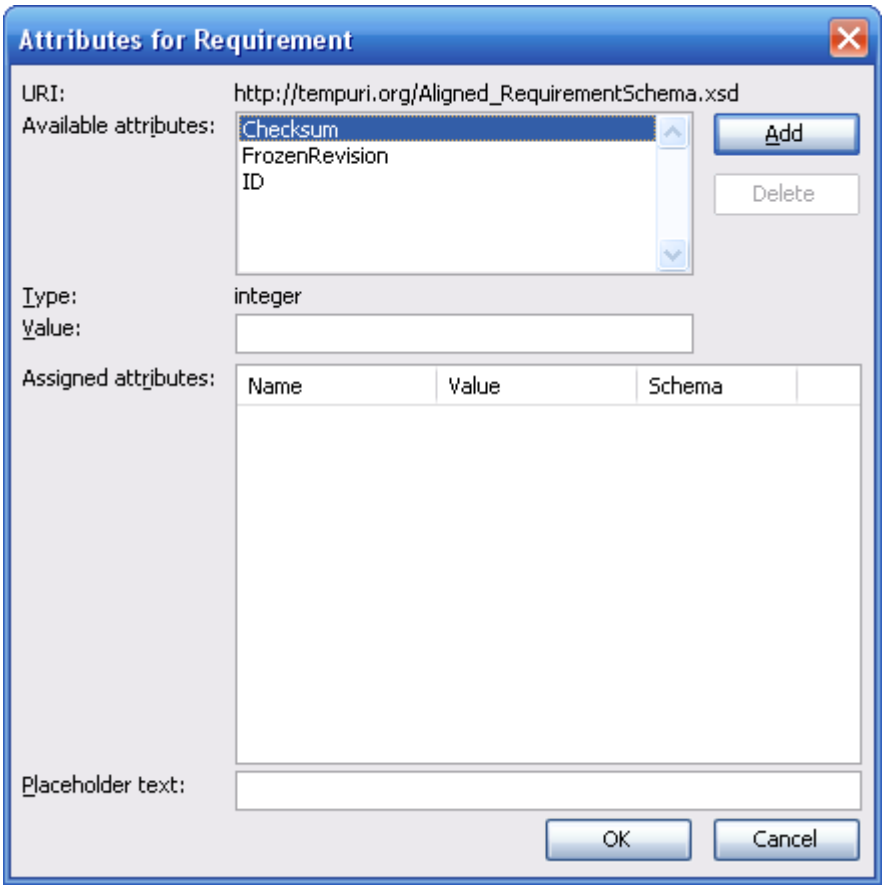
Document Object Attributes in Tables

If a document object attribute is a table attribute, e.g. the „main-flow“ in a use case, then each of the column names appears in the list of available tags. In order to uses these in your template, create a table and put the tags in one row of it. When the template is populated with data from your project, the system will automatically add rows to the table and write the corresponding data to them.

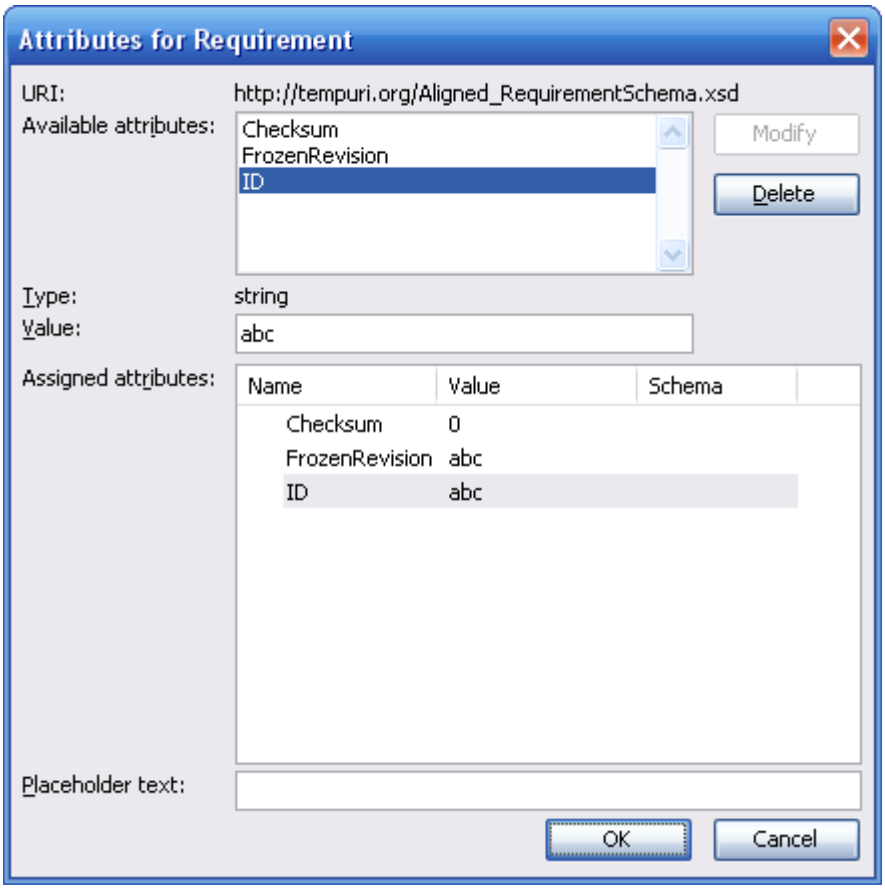
Setting XML Attribute Values

XML Attributes are used to define certain properties of an XML tag. The available XML Attributes are defined in the attached schema, but before Word can use them at a later stage, you have to set them to a default value.

When selecting a tag, pressing the right mouse-button and then selecting „Attributes“, the following dialog appears:



You now click on each of the available xml-attributes, enter an arbitrary value in the field value. If the „Type“ field specifies the value to an „Integer“ you have to enter a number, if it specifies the value to be of type „String“, you can enter any text, e.g. „abc“.



Formatting

When inserting a document object into the word document, the fields are populated with the corresponding data from the attributes. The formatting with which they will appear in the Microsoft Word document is the same as specified in the template. The only examples are rich-text fields. For these fields the formatting used in the field is used.

Xml Attributes of Regular Tags

Note! The attributes displayed with a gray background below are managed by Aligned Elements. When defining a template, these values must be set, but the value is not considered. Therefore insert an arbitrary value.

Tag	Attributes	Value to add
The Main Document Object tag	ID	An arbitrary text
	Checksum	An arbitrary number
	FrozenRevision	An arbitrary text
Title	None	N/A
Attribute tags	ID	An arbitrary text
	Checksum	An arbitrary number
Column tag	ID	An arbitrary text
	Checksum	An arbitrary number
	IsColumn	Yes or No (doesn't

		matter)
	OriginalRowNo	An arbitrary number
	Duplicate (If the attribute value is not set for the traced object, then take the previous value in the table.)	Must be either Yes or No
	DefaultText	User defined text to be displayed if the attribute does not have a value.

Special Tags

In addition to tags which directly correspond to attribute names of the document objects there are some additional tags, which are not attributes. Among these extra tags, there are those which appear for every document object type and some which are type specific. The tags common to all document types are:

Name of Tag	Meaning	Attributes
ID	Used to store the document object id in the word document.	None
Revision	This is the revision of the tag.	None
TracedObject	Used to display an attribute of an object to which the original (which is in the document) is tracing to.	ID, Checksum,TracedFromType,TracedToType,Attribute
OleObject	Used to insert an OLE-object into the document	ID, Checksum, FileAttributeName
Checkbox	Elements is able to set the content of a checkbox, depending on the value of an attribute of the document object.	Type, Attribute, EnabledIfEqualTo
Number	This tag can be placed in tables (which contain traced objects) and displays the row index. The first index is “1”	None
Inconsistency	Used to display an inconsistency into the document.	InconsistencyName, TextWithIncon, TextWithoutIncon
RevisionHistory.Revision	The current revision of the document object.	None
RevisionHistory.User	The user who created the current revision of the document object.	None

There are also tags which are specific to the Failuremode template:

- *RPN*, this is the value of severity * probability * visibility and is called risk priority number.
- *NewSeverity,* this is the value of the initial severity minus all severity reductions.
- *NewProbability,* this is the value of the initial severity minus all probability reductions.
- *NewVisibility,* this is the value of the initial visibility minus all visibility enhancements.
- *NRPN,* this is the value for NewSeverity*NewProbability*NewVisibility
- *CombinedID,* this is field which consists of a combination of the ids of the current failure-mode, the current hazard and the current mitigation. This can be used to uniquely identify each row in a table of hazards.

Attributes of special Tags

In some cases, a template for a document object type also contains parts of other document object types. E.g. if you are currently designing a template for a Failure-mode, you might want to include its hazards and mitigations into the same template. The „Traced Object“-tag allows you to do just that.

Attributes of the TracedObject Tag:

Note! The attributes displayed with a gray background below are managed by Aligned Elements. When defining a template, these values must be set, but the value is not considered. Therefore insert an arbitrary value.

Attribute Name	Meaning	Default	Example
TracedFromType	this is the type from which the object is traced	No default, this must be set to the correct type.	“Failuremode”
TracedToType	This is the object type to which is traced.	No default, this must be set to the desired type.	“Hazard”
AttributeName	This is the attribute from the „TracedtoType“ which is to be displayed	None	“Title”
ContainingFilesAttributes	If the TracedObject is configured to display the file objects in which an object is contained, this attribute must	The attributes must be specified.	“ID,Title,FileName”

	be set to the list of attributes (of the File Object), which are to be displayed.		
Duplicate	If the attribute value is not set for the traced object, then take the previous value in the table.	Must be either “Yes” or “No”	“Yes”
StartNewRow	Start a new row for this traced Object.	Must be either “Yes” or “No”	“No”
OriginalRowNo	This attribute is assigned by Aligned Elements to detect if rows in a table have been added or deleted	An arbitrary number.	“0”
FileIDs	If the TracedObject is configured to display the file objects in which an object is contained, this is a list of IDs which Aligned Elements uses during synchronization.	In case of displaying File Objects this must be set to an arbitrary text. Can be empty otherwise	“abc”
ID	Used by Elements to keep track which objects are inserted into the current document.	An arbitrary text	“abc”
Checksum	Used by Elements to detect changes to the object in the document	An arbitrary number	“0”

Example (Displaying Failuremodes):

So in order to display a failure-mode, with all the titles of its hazards and all the titles of mitigations for each of those hazards, the following two Traced Object tags are needed.

TracedFromType = „Failuremode“
TracedToType = „Hazard“
AttributeName = „Title“

TracedFromType = „Hazard“
TracedToType = „Mitigation“
AttributeName = „Title“

This will then list all hazard titles and all mitigation titles for each of those hazards.

Note: Because it is possible to add multiple „Traced Objects“-tags for a document object, the Traced Object tag must always be part of a table. This is a condition. This allows the multiple objects to be listed in the table.

Note: If you plan to use the ContainingFilesAttributes tag, the AttributeName entry must be set to “ContainingFiles”.

Attributes of the OleObject Tag:

Note! The attributes displayed with a gray background below are managed by Aligned Elements. When defining a template, these values must be set, but the value is not considered. Therefore insert an arbitrary value.

Attribute Name	Meaning	Default	Example
FileAttributeName	The name of the file attribute in the document object, which stores the OLE object	None	“File”
ID	Used by Elements to keep track which objects are inserted into the current document.	An arbitrary text	“abc”
Checksum	Used by Elements to detect changes to the object in the document	An arbitrary number	“0”

Attributes of the Checkbox Tag:

Note! The attributes displayed with a gray background below are managed by Aligned Elements. When defining a template, these values must be set, but the value is not considered. Therefore insert an arbitrary value.

Attribute Name	Meaning	Default	Example
Type	The type of the document object to which the original object traces.	None	“Issue”
Attribute	Attribute of the traced document object, which is used to dertermine the value of the checkbox.	None	“Priority”
EnabledIfEqualTo	If the attribute value is equal to the value in “EnabledIfEqualTo”, then the checkbox is checked.	None	“High”
IsColumn	This attribute is used by Elements to determine if a CheckBox tag is in a column of a table	“yes” or “no”	“yes”
OriginalRowNo	This field is assigned by Aligned Elements to detect if rows in a table have been added or deleted	An arbitrary number.	“0”

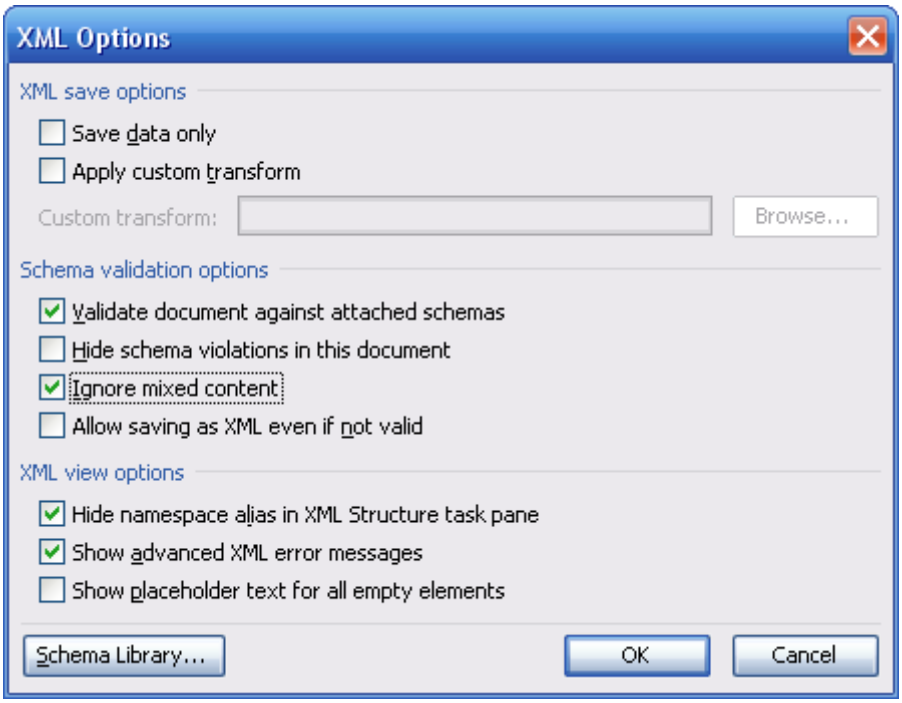
Attributes of the Inconsistency Tag:

Attribute Name	Meaning	Default	Example
InconsistencyName	This field specifies the rule, which is to be checked.	This must be set to one of the available rules: • "AttributeStateInvalid" • "NotReviewed" • "RiskNotMitigated" • "IssueOpen" • "IsSuspect" • "DateOverdue" • "DateDue" • "DocumentObjectNotInFil	“NotReviewed”

		e" • "LastRevisionNotInFile" • "DHFPhase" • "DHFFullfiller"	
TextWithIncon	This user-defined text is displayed, if the object has the specified inconsistency	The user defined message	“This requirement is not reviewed”
TextWithoutIncon	This user-defined text is displayed if the object does not have the specified inconsistency	The user defined message	“This requirement is reviewed”

Setting the XML Options

Now click on „XML Options…“, and make sure that „Ignore mixed content“ is checked.



Document object revision history

Now store the document in the directory *RTFTemplates* , which is a subdirectory of the template directory of your project. The format of the file must be chosen to be XML. The name of the file must be the same as the name of the document object type. E.g. the name of the template for requirements must be „Requirement.XML“.

Creating templates for Chapters

When dragging chapters into a Word document, they are also displayed with the help of word templates. Chapters have a „Level“, assigned to them. The first level is the level of the document object type itself, e.g. „Requirements“. Chapters of this level are inserted into the document according to the template called „Chapter1.xml“. Chapters one level below are inserted according to the template „Chapter2.xml“, etc. If you need a chapter template to be book specific, e.g. you want a different formatting for chapters in Requirements, you can enter the bookname before the xml extension. So to have a specific formatting for the level 2 formatting in Requirements, you define a template called “Chapter2.Requirement.xml”. If this file is not available, Aligned Elements will continue to search for “Chapter2.xml”.

Setting up chapter templates for synchronization

If it is desired that chapter are also considered during synchronization, see 4.7.1, then the attributes ID, Project, TypeName and Version must be set to a default value. If they are not set, chapters will not be synchronized.

Creating templates for trace tables

To define a template for a trace table do the following.

1. Create a new Microsoft word document.
2. Attach your schema for trace tables to your document. The schema can be found in the directory “TraceTemplates”, which is a subdirectory of your template directory.
3. Create a table with as many columns as you need. The number of rows is one if you do not need headers, otherwise two.
4. Now apply the tag “TraceTable to the whole document.
5. If you need a header format the first row of the table accordingly.
6. In the first column of your table, insert the “From” tag”.
7. In all other columns insert the “To” tag.
8. Insert the “ID” tag within the “From” and all “To” tags.
9. Apply formatting to all lines, or add optional text anywhere in the file, but not within the “ID” tags. For example a text like “Traces from Requirements to …” might be useful.
10. In the “TraceTable” tag, set the attribute “ID” to a name which describes the Table. This name will later appear in the word integration, when you choose to insert a trace table.
11. In the “From” and “To” tags set the attribute “Type” to the type of document object which should be shown in this column. F.e. The “From” tag could be set to “Requirement”, the first “To” tag to Specification” and the second “To” Tag to “Testcase”.

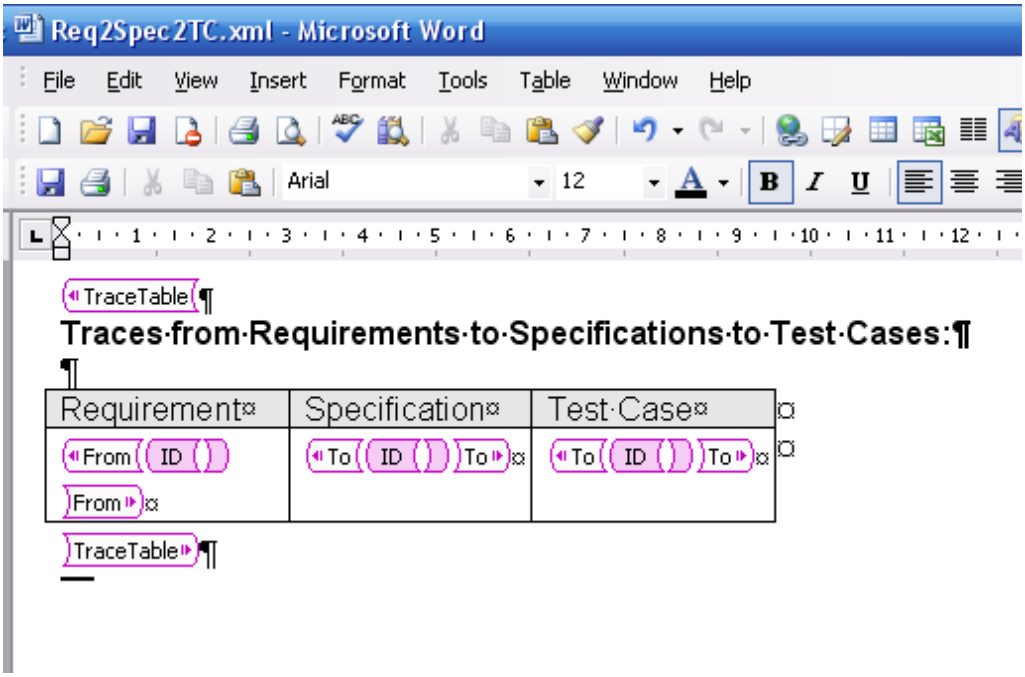
Aligned AG, Binzmühlestr. 210, 8050 Zürich, Phone +41(0)44 312 50 20, Fax +41(0)44 312 50 20, www.aligned.ch, info@aligned.ch

12. In the “ID” tags, set the attributes to “ShowRevision” and “ShowTitle” or “True” or “False”. Setting “ShowRevision” to True will cause the revision to be shown with each entry. If “ShowTitle” is set to “True” then also the title is shown. With neither “ShowTitle” nor “ShowRevision” set to “True” only the ID of the object will be shown in the table.

13. If you want to create Hyperlinks from a “To” column in one trace table to a “From” column in another trace table in the same document, then set the attribute “LinkTo” to the name (i.e. the value of the attribute “ID” in the “TraceTable” tag) of the second trace table.

14. Now save the document in xml format into the directory “TraceTemplates” which is a subdirectory of your template directory.

Note! If you do not want to link to another table, please remove any text from all “LinkTo” attributes. This will significantly enhance the performance of inserting trace tables.



Creating a template for object queries

To define a template for an object query do the following.

1. Create a new Microsoft word document.

2. Attach your schema for query tables to your document. The schema can be found in the directory “QueryTemplates”, which is a subdirectory of your template directory

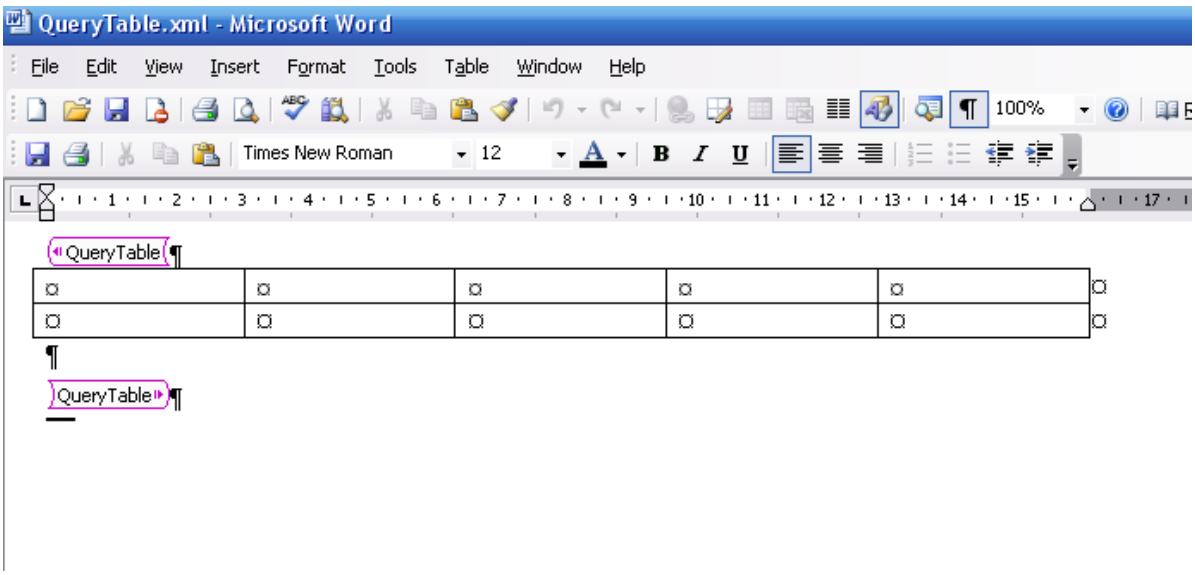
3. Create a table with at least one column and one row. The system will automatically adapt the number of rows and columns as needed.

4. Now apply the tag “QueryTable to the whole document.

5. Now set the attributes of the tag “QueryTable”. Set QueryName to an arbitrary Text, DataRow to the number of the in which you want the data to start, HeaderRow to the number of the row in which you want the header to be displayed, set ShowRevision to “True” if the revision of the document objects should also be shown in the list and set StartColumn to the first column where the data should be inserted. Please note that the number of the first column and the number of the first row is 1.

6. Now save the document as “QueryTable.xml” into the directory “QueryTemplates” which is a subdirectory of your template directory.

The word template should now look similar to the one displayed below



6.9. Installation of Aligned Elements

6.9.1. Installation of Microsoft SQL Server Database

Step 1: Download SQL Server 2005 Express Edition

To install Sql Server 2005, execute the installation according to the section Install SQL Server 2005 in http://msdn.microsoft.com/en-us/library/ms143219.aspx#,

or for the SQL Server 2005 Express edition,
Install SQL Server Express from
http://msdn.microsoft.com/en-us/library/ms143722.aspx

or install SQL Server 2005 Express Edition with Advanced Services SP1 on from
http://go.microsoft.com/fwlink/?LinkId=65109

Note! You will need a DB password to complete the installation. Obtain this password from your Aligned AG contact.

Step 2: Install database software prerequisites

Install the following items in order.

Internet Information Server 5 or higher
If your Windows server does not have IIS installed, go to Start | Control Panel | Add or Remove Programs | Add/Remove Windows Components. It is not a must to install this component but it is an official prerequisite none the less.

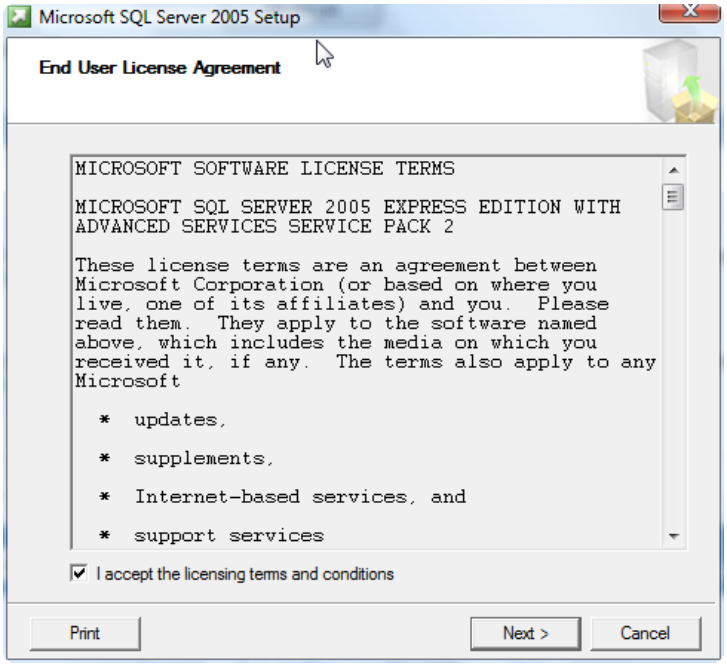
.NET Framework 2.0
If it is not installed already on your machine, download the .NET Framework 2.0 (x86) from
http://www.microsoft.com/downloads/details.aspx?FamilyID=0856eacb-4362-4b0d-8edd-aab15c5e04f5&DisplayLang=en
After downloading, execute *dotnetfx.exe* and follow the instructions to complete the installation.

MSXML6
Download MSXML6 from
http://www.microsoft.com/downloads/details.aspx?familyid=993C0BCF-3BCF-4009-BE21-27E85E1857B1&displaylang=en
Execute *msxml6.msi*. This is a quick installation.

Step 3: Install SQL Server 2005 Express Edition

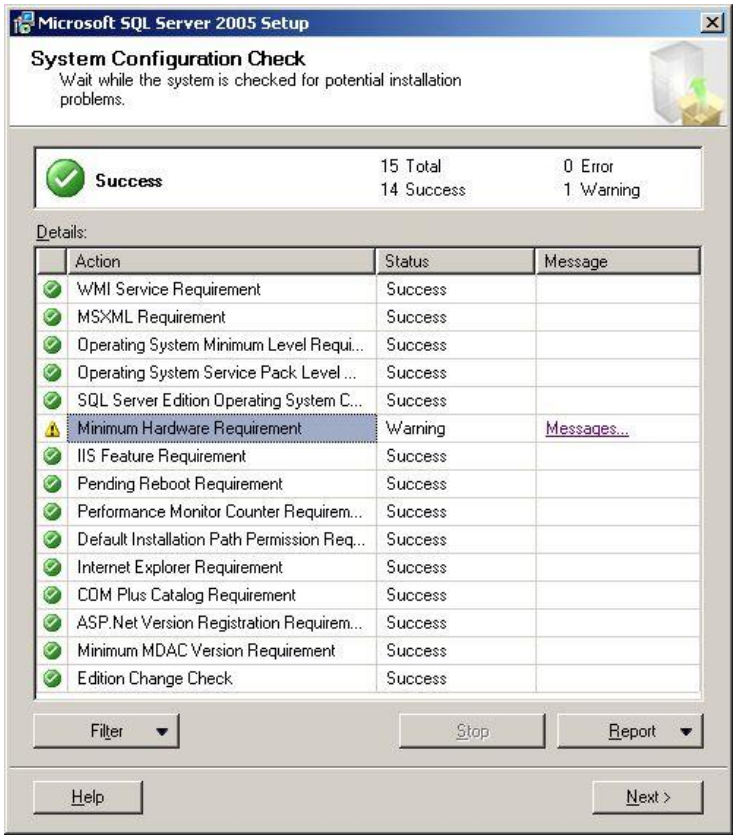
The name of the downloaded file is *SQLEXPR_ADV.EXE*. Double-click this file to start the product installation. The contents of the file are extracted and the installation begins.
After you start the installation, you have to agree to the typical End User License Agreement after which you're presented with a screen that shows you what prerequisites you need to get the express edition on your system. The installer will handle the installation of these prerequisites for you. Click the Install button to install these items if you are prompted to install any. Once the items are installed, click the Next button.

Figure A



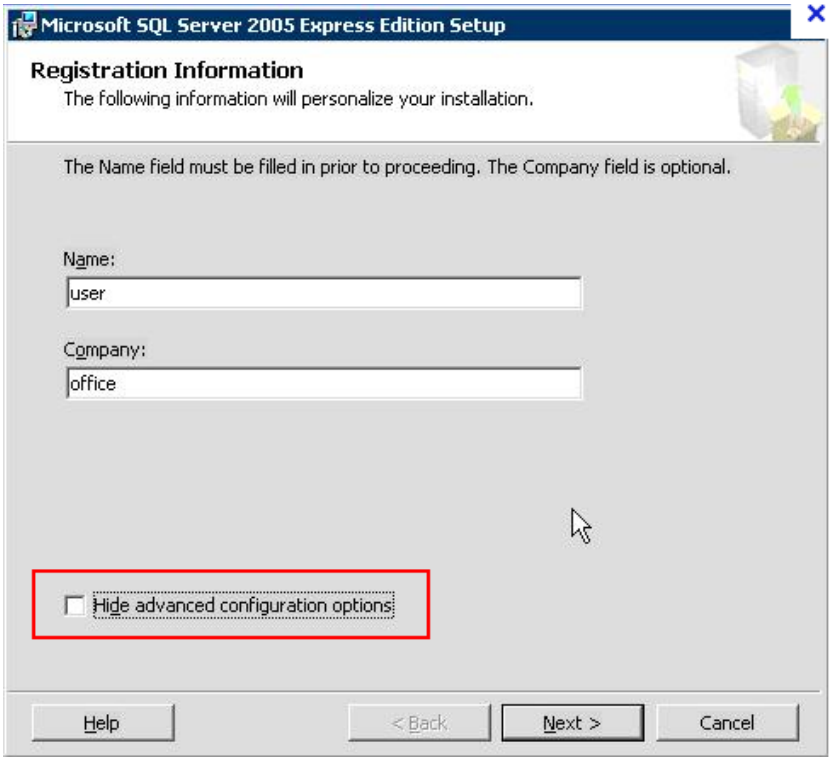
In **Figure B** below, the installer will scan your computer and check that it meets all install requirements. However, some warnings are not show-stoppers, so you can continue. Note that the installer provides you with a complete status report to make it easy for you to determine what needs to be done.

Click Next to continue.



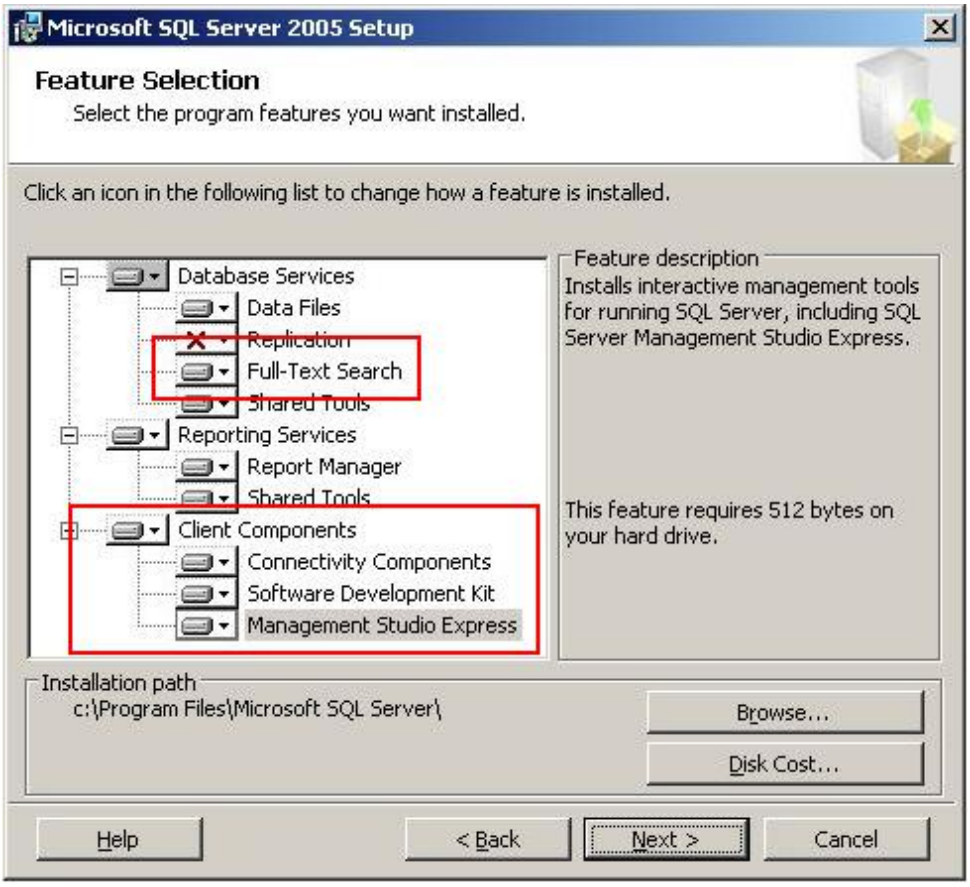
If you have any serious problems, correct them before you continue.

After that, you have to provide your name and, optionally, your company's name.
Un-check the box marked "Hide advanced configuration options"



Provide registration details for your server installation.

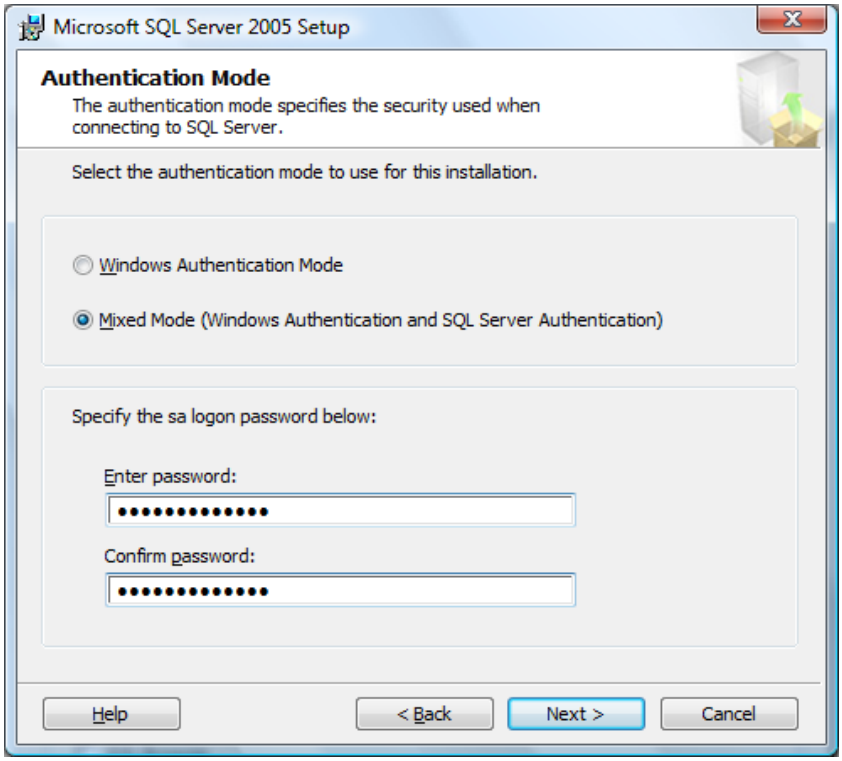
Select Full-Text Search and all Client components in this dialog and click Next.



VERY IMPORTANT! In the dialog depicted in Figure E,

- Select “Mixed Mode”
- Enter a password for the sa user.

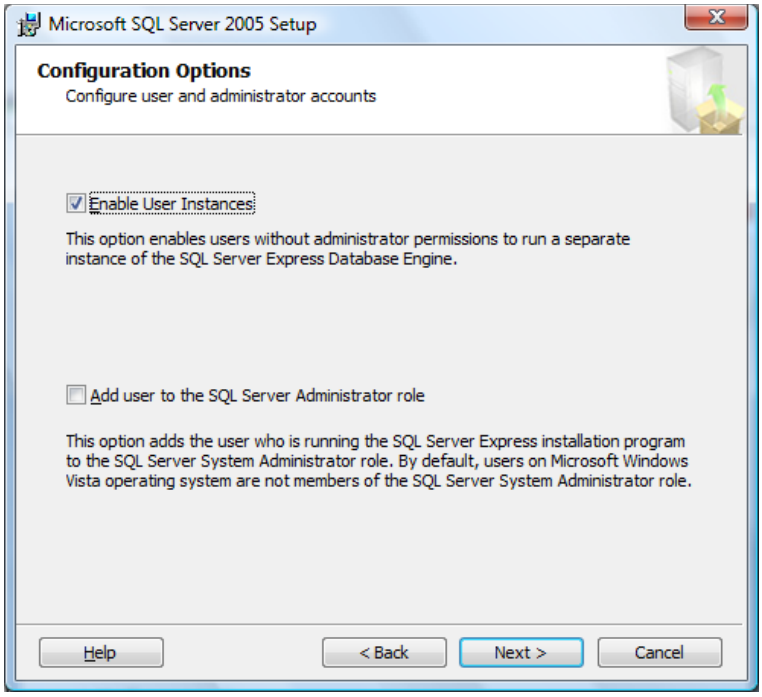
Figure E



Choose the mode under which you want to authenticate SQL Server users.

These options are not important to Aligned Elements. Continue with standard settings.

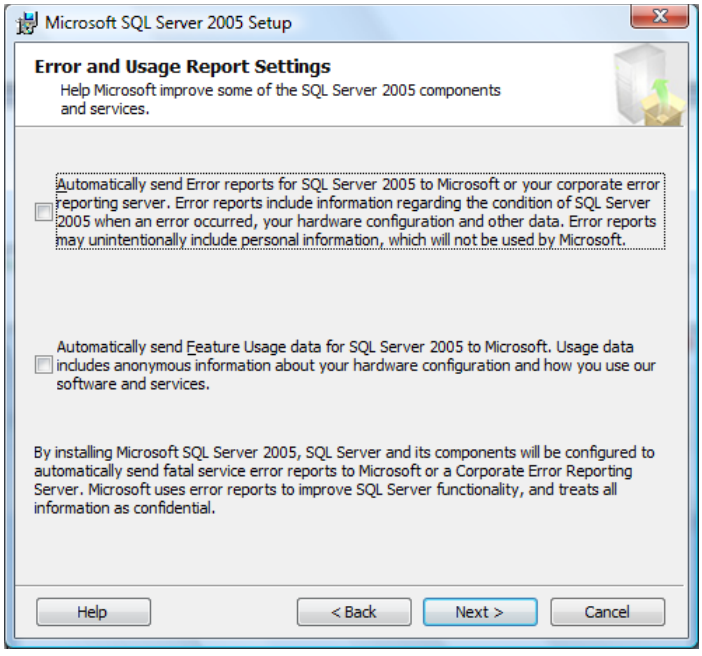
Figure G



Decide whether you want to enable support for user instances.

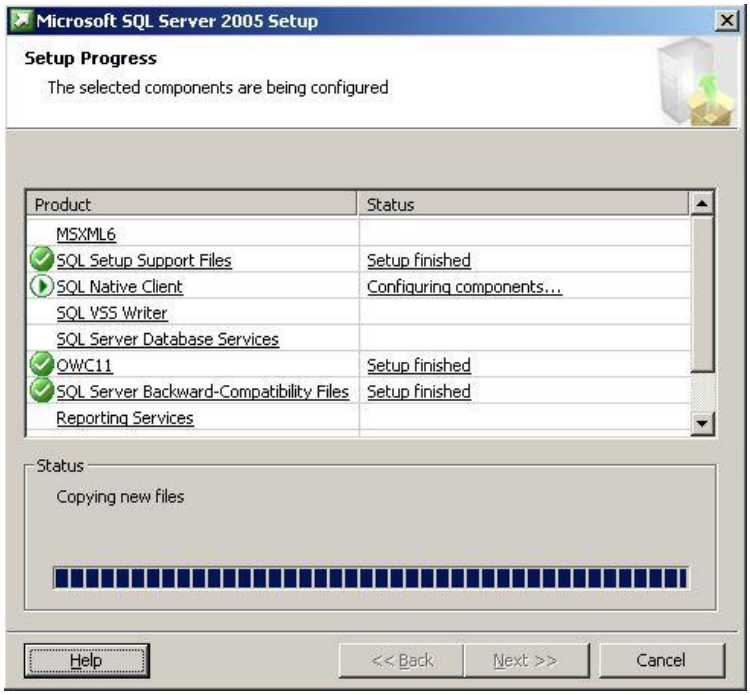
In this option you can chose if you want to allow SQL Server to automatically send error reports back to Microsoft. Is not compulsory for our installation sp you don't have to check it.

Figure H



These are all of your options for SQL Server 2005 Express Edition. Continue on to install the product using these selections.

Figure I



Step 4: Install full-text filter packs

You now need to install a filter pack to allow sql server to read the content of different document types (e.g. doc, docx)

Download from http://www.microsoft.com/download/en/details.aspx?id=20109. Select the correct version depending on your OS (32 or 64 bit)

Start installation by clicking on FilterPackx86.exe (or FilterPackx64.exe)

To register the filter packs, please follow these steps (from http://support.microsoft.com/kb/945934)

1. Start SQL Server Management Studio.
2. In SQL Server Management Studio, select the instance in which you want to enable IFilters, and then run the following command in that instance:

   sp_fulltext_service 'load_os_resources', 1

3. If you are running SQL Server 2008, go to Step 4. If you are running SQL Server 2005, stop and restart the msftesql service. To do this, follow these steps:
   a. At a command prompt, type the following command and then press Enter:

      net stop msftesql

      Note To stop the msftesql service for a specific instance, run the following command:

      net stop msftesql$InstanceName

b. At a command prompt, type the following command and then press Enter:

net start msftesql

Note To start the msftesql service for a specific instance, run the following command: net start msftesql$InstanceName

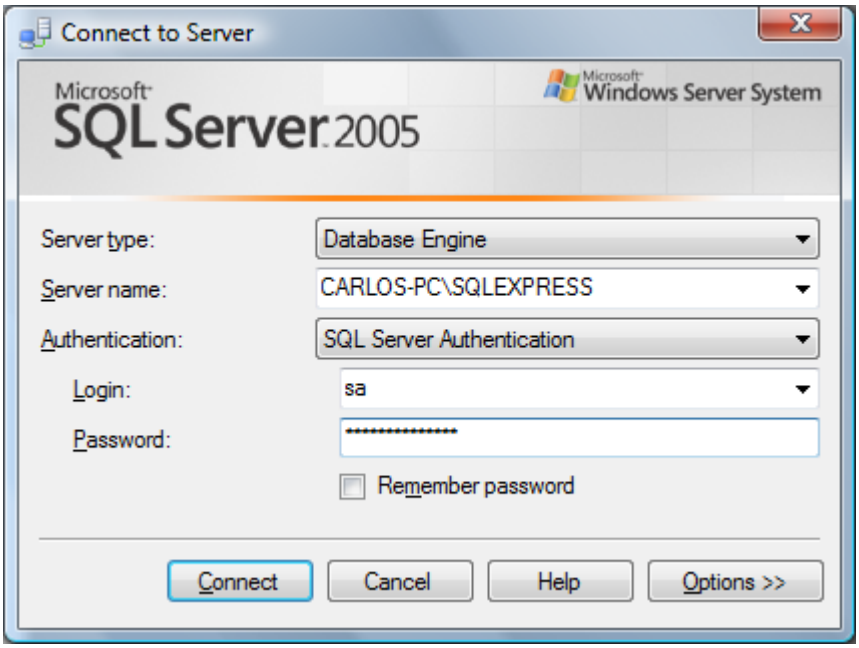
4. Restart the SQL Server service.

Step 5: Adapt the SQL Server Instance User Account

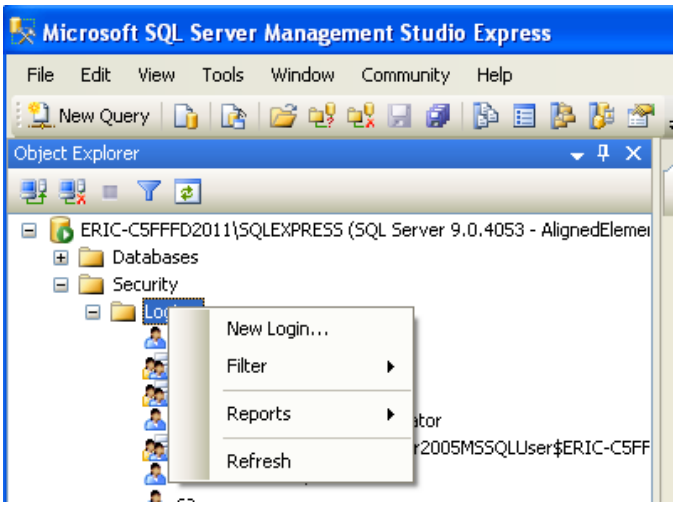
Start SQL Server Management Studio Express

In the log in box use the option as displayed below. NB! The server name must correspond to your computer name. The instance name is “SQLEXPRESS” by default.

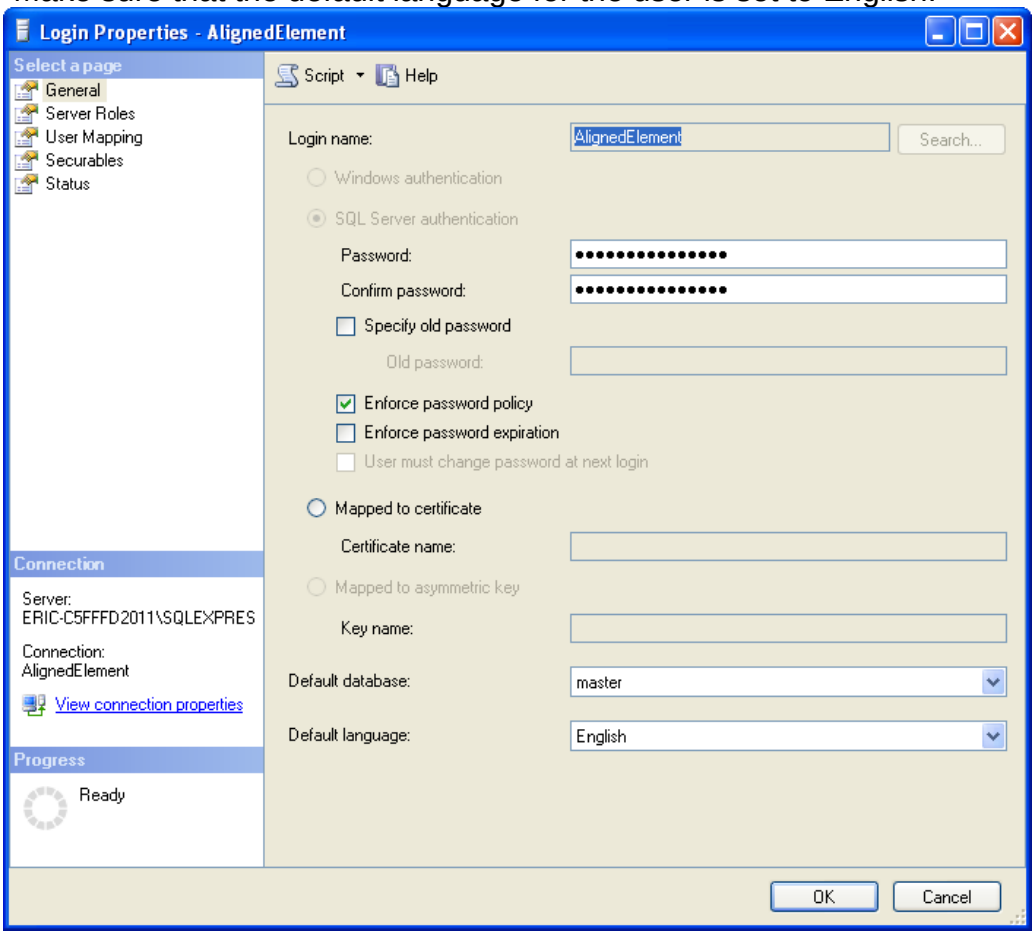
Use the password created above.



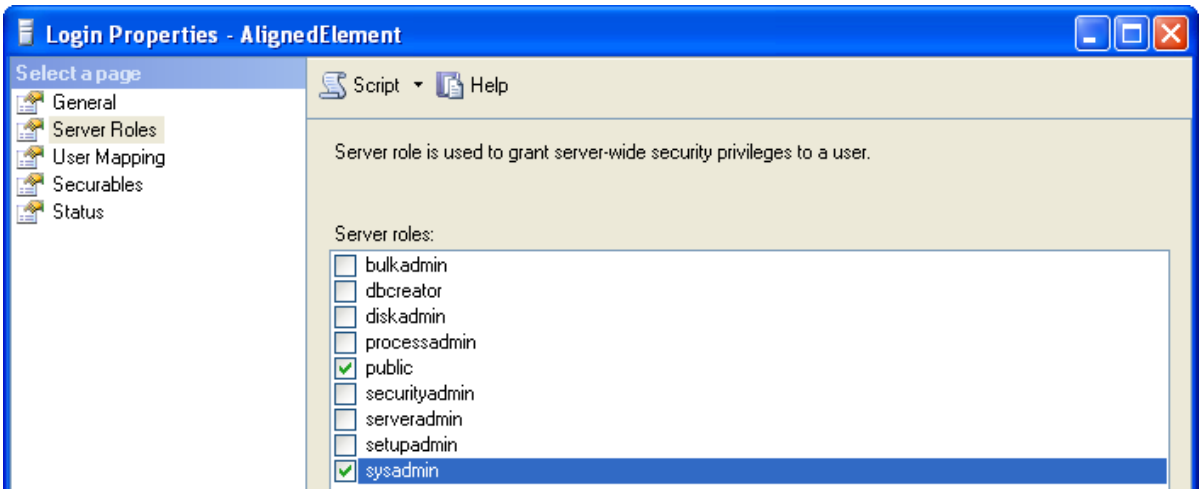
-In the “Security” folder, select the “Logins” folder, right click and select the option “New Login…”.



-Create a new user name with the name “AlignedElement” (not “AlignedElements”).
-Set the password to the password that you have obtained from your Aligned contact.
-Check “Enforce Password Policy” and uncheck “Enforce password expiration”.
-Make sure that the default language for the user is set to English.



-Make sure that the user “AlignedElement” is assigned to the Server Roles “public” and “sysadmin”.



Test the new login by logging in again with the user AlignedElement.

6.9.2. Install Project Templates

For all projects in Aligned Elements you need a common location for the project templates. Important is that the path needs to be the same for all different users e.g. *\\serversoandso\Your Templates* or a commonly mapped drive on the network e.g. *g:\Your Templates*.

1. To install, copy the template files provided by Aligned AG to your dedicated template directory.

2. Ensure that all intended users have read and write access rights for the template directory.

6.9.3. Install Client

The client is installed from the Aligned Elements website (see the installation URL on your license agreement).

Aligned Elements Client Pre-requisites:

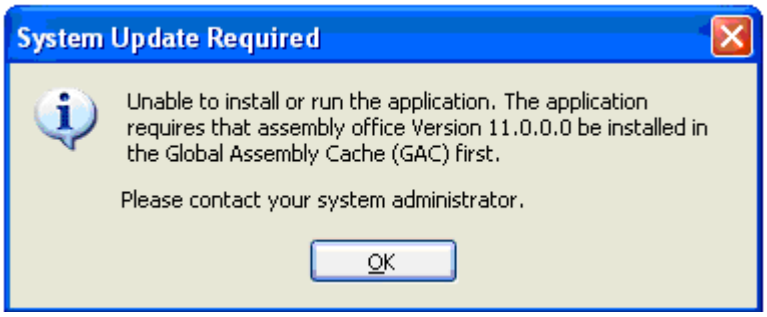
The following PC requirements apply:

1. Windows XP SP2 or Microsoft Vista
2. It is recommended to have at least 512Mb RAM available.
3. Microsoft Office 2003 Professional must be installed on the PC. Aligned Elements will run without the professional version but the Professional version is required to support the Word Integration.
4. You have a valid license from Aligned AG.

Installation Steps:

1. Navigate to the installation URL in your web browser.
   To install all pre-requisites and the application, click **Install**. If you already have all pre-requisites (they are listed on the page) you can directly click on the link Launch.
   Note: You need to have Internet Explorer as your default browser. You can also use Firefox if you install the FFClickOnce plug-in prior to the installation from:
   https://addons.mozilla.org/firefox/1608/
2. After all pre-requisites are installed, the application is automatically started.
3. You are prompted to install the license for Aligned Elements. Browse to the license file issued by Aligned AG.

Note:
Should the following message appear during the installation,



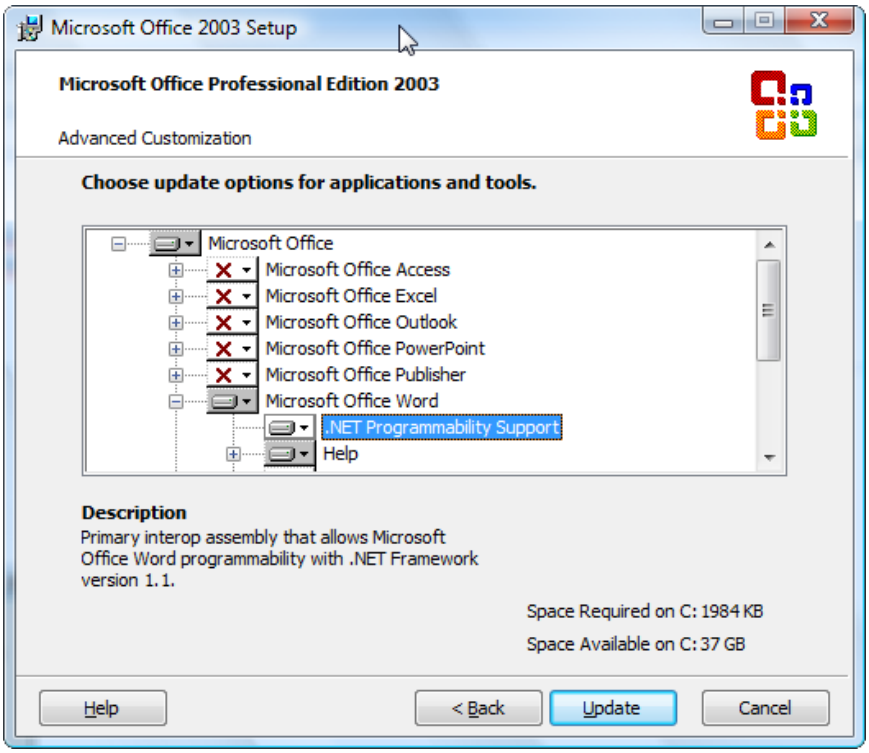
then you will need to rerun Office setup to install .NET programmability support. Do the following:

Open **Add/Remove programs** in control panel (Programs)

Select **Microsoft Office 2003 Professional** and click "**Modify**" or "**Repair**" (not deinstall)

Select **Add/Remove Features** for Word and click **Next**.

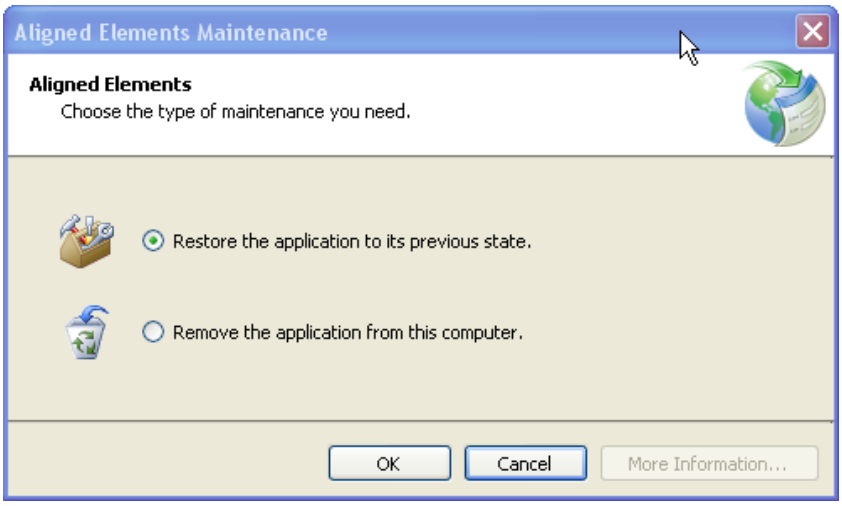
Select to install ".NET Programmability Support for Word" as displayed in the screen shot below.



Click **Update** to install this feature.

Application Updates:
Application updates are automatically detected when you start Aligned Elements. You are prompted if you want to install the new version. If you acknowledge, the new version is installed and the application will restart when done.

If for some reason you want to revert to the previously installed version, you can do so from Add/Remove Programs in the Control Panel. Select Aligned Elements in the list of installed programs and click, Change/Remove. The following dialog is displayed:



Select Restore the application to its previous state and click OK to revert to the older version.

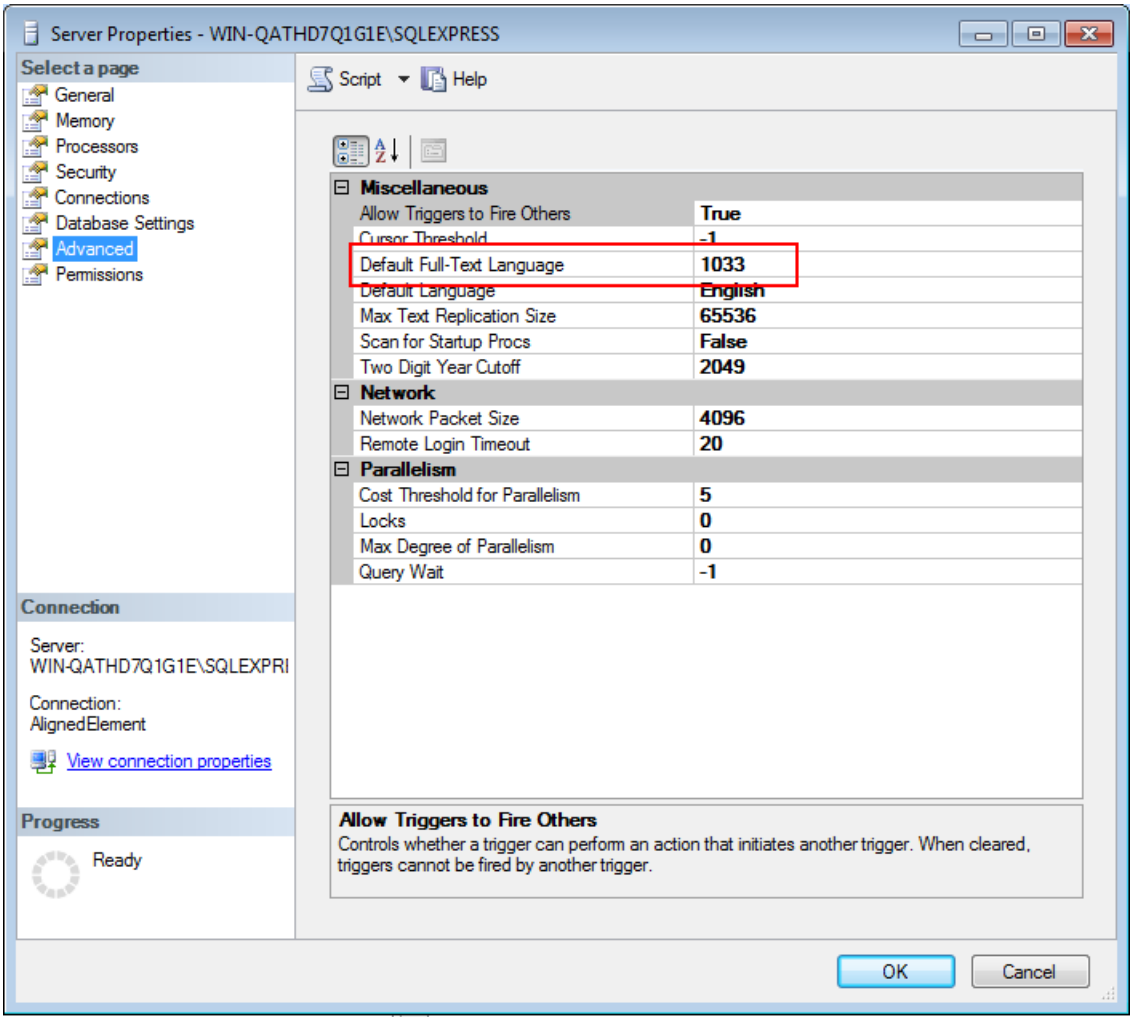
6.9.4. Automatic upgrade of project database

The first time a new version of an Aligned Elements client loads an existing project database (created in a previous version of Aligned Elements), the database will automatically be upgraded to match the new version. The user will be informed during project load and may choose to cancel the upgrade procedure. After an upgrade it is possible that older versions of Aligned Elements may not work properly.

6.9.5. Using Sql Server Full Text Search

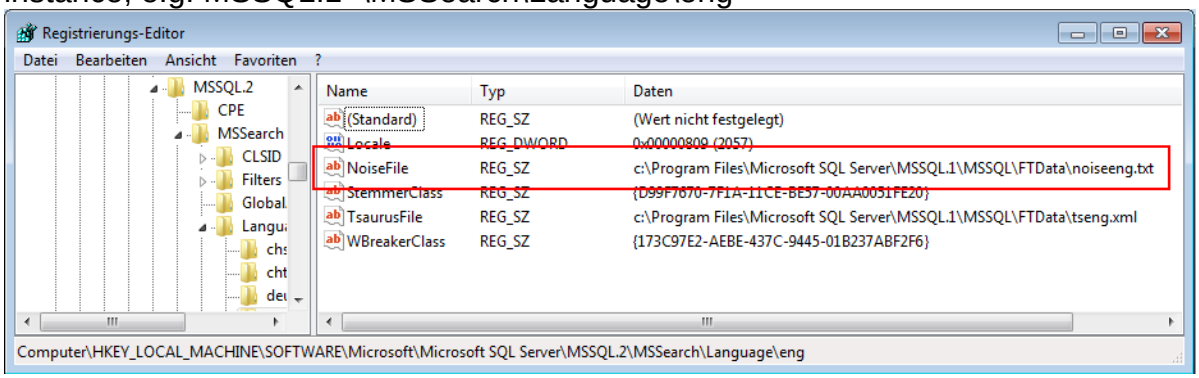
Letting your database use the Full Text search capabilities from Sql Server will improve the query response times significantly for a number of operations. To switch on this option, please install the Full text service from Microsoft. For Sql Server Express, it is available as part of the “Microsoft SQL Server 2005 Express Edition with Advanced Services”. For other editions of Sql Server, it is part of your normal distribution.
If the Full Text service is installed, Aligned Elements will automatically configure the database to use the service.
Note: When the full text service is used, some words “noise”-words, e.g. “is”, “are” etc.) will not return any result since they are not considered as relevant words. To change the content of the noise word file, follow the instructions belowConfiguring Full-Text Noise Words SQL Server 2005:

1. Check default full-text language code by using the context menu on the root in Object Explorer to access the Server Properties. Note that the Default Language not necessarily is the same as the Default Full-Text Language.



2. Check available languages by running the following query on the root in the Object Explorer.
```
select * from sys.fulltext_languages
```
This will render in a list of ID and language names. Compare with the ID code from 1.

3. Check which noise file that corresponds to the language: HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL Server\<your SQL Server instance, e.g. MSSQL.1>\MSSearch\Language\eng



4. Open file in a normal text editor (e.g. Notepad) and modify/remove noise words in the file. Save the file.

5. Rebuild indexes, (needs to be done for all databases)
```
alter fulltext index on tblRevisableObject set change_tracking off
alter fulltext index on tblRevisableObject start full population
alter fulltext index on tblRevisableObject  set change_tracking auto
alter fulltext index on tblAttribute set change_tracking off
alter fulltext index on tblAttribute start full population
alter fulltext index on tblAttribute set change_tracking auto
alter fulltext index on tblFileAttributeValue set change_tracking off
alter fulltext index on tblFileAttributeValue start full population
alter fulltext index on tblFileAttributeValue set change_tracking auto
```
6. Test that the search behaviour is as expected

Configuring Full-Text Noise Words SQL Server 2008

For SQL Server 2008 the noise words are no longer store in text files and the term noise-words has been replaced by stop-words. Please see http://msdn.microsoft.com/en-us/library/ms142551.aspx for information on how to manage stop-words for SQL Server 2008. The indexes listed above for SQL Server 2005 still apply.

6.10. Maintenance of database

Aligned Elements use Microsoft SQL Server Please refer to the vendor documentation [1] and [2] in **1.3 References** for detailed information on how to set up daily backups of the database and to perform database recovery. Below you will find a short description on how to set up a daily backup or move a database to a different server.

6.10.1. Initial Configuration of Microsoft SQL Server 2005

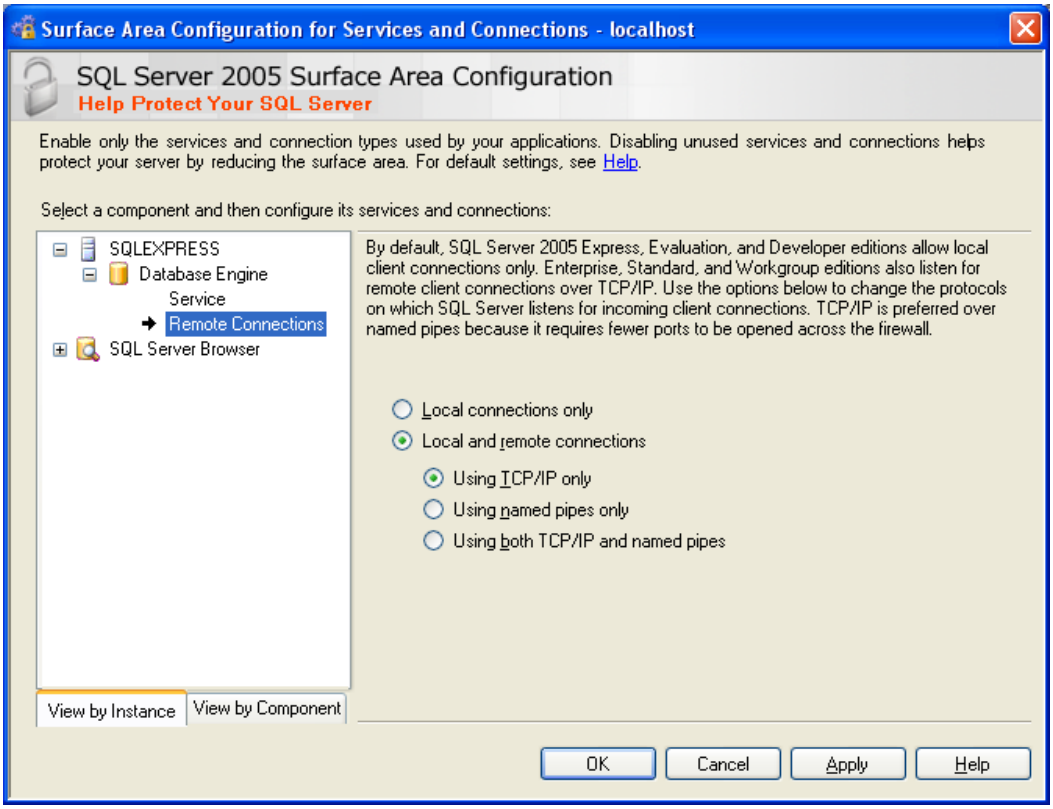
The instructions below are based on the configuration of the Microsoft SQL Server 2005 Express Database but also apply to the Microsoft SQL Server 2005.

Step 1- Configure your database server for remote access

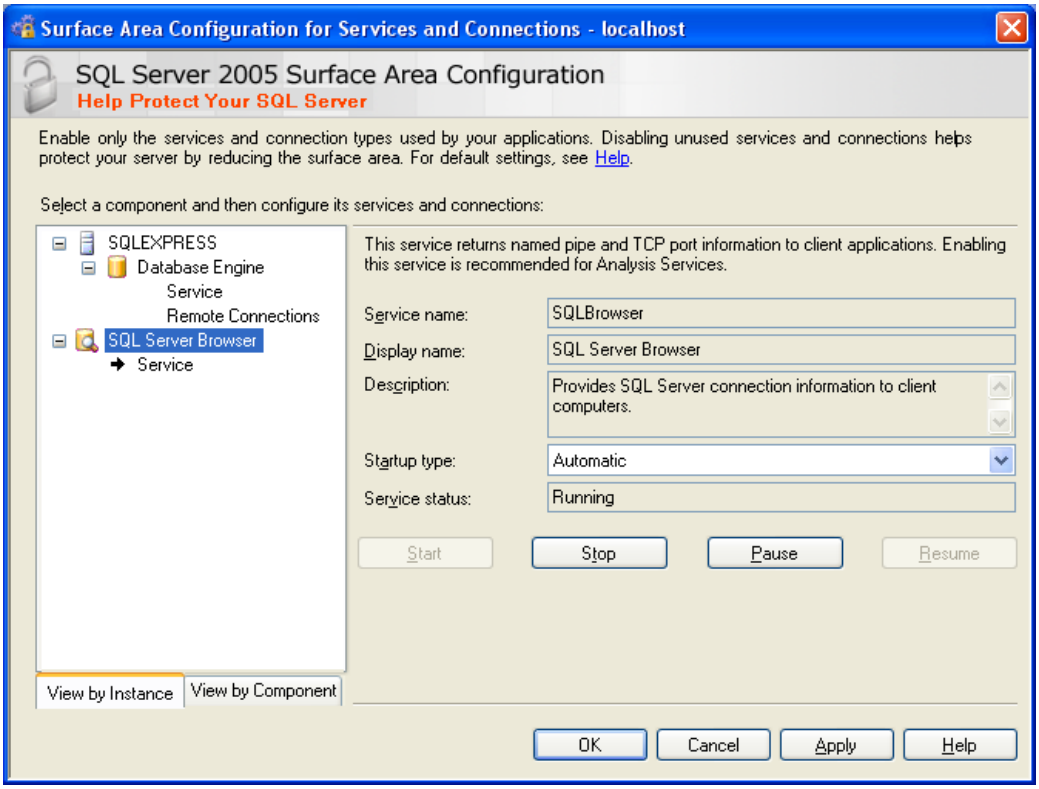
1. Start the surface area configuration tool:

2. Select "…for Services and Connections"

3. For remote connections, switch on local and remote connections using TCP/IP connections:

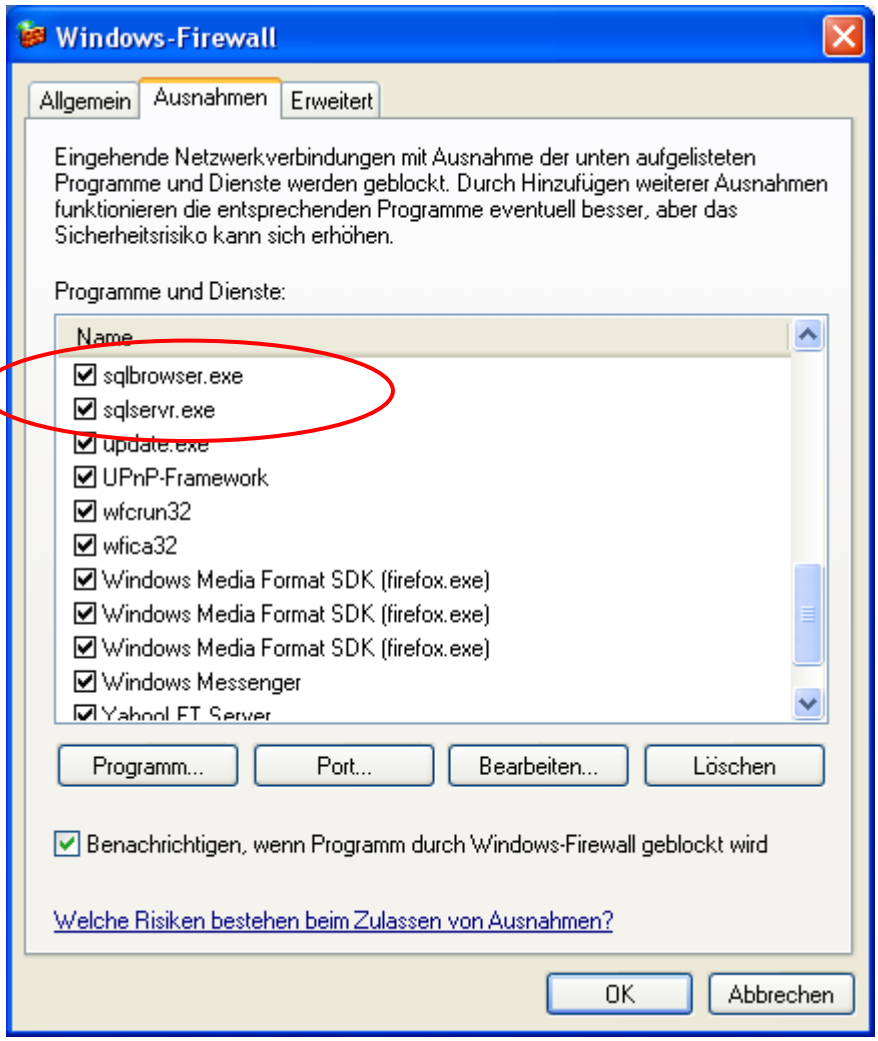


4. To enable the possibility to scan for databases over the network, set the sql server browser to automatically start (and start it if it is not currently running):



Step 2 - Configure the Firewall on the PC where the Database Resides

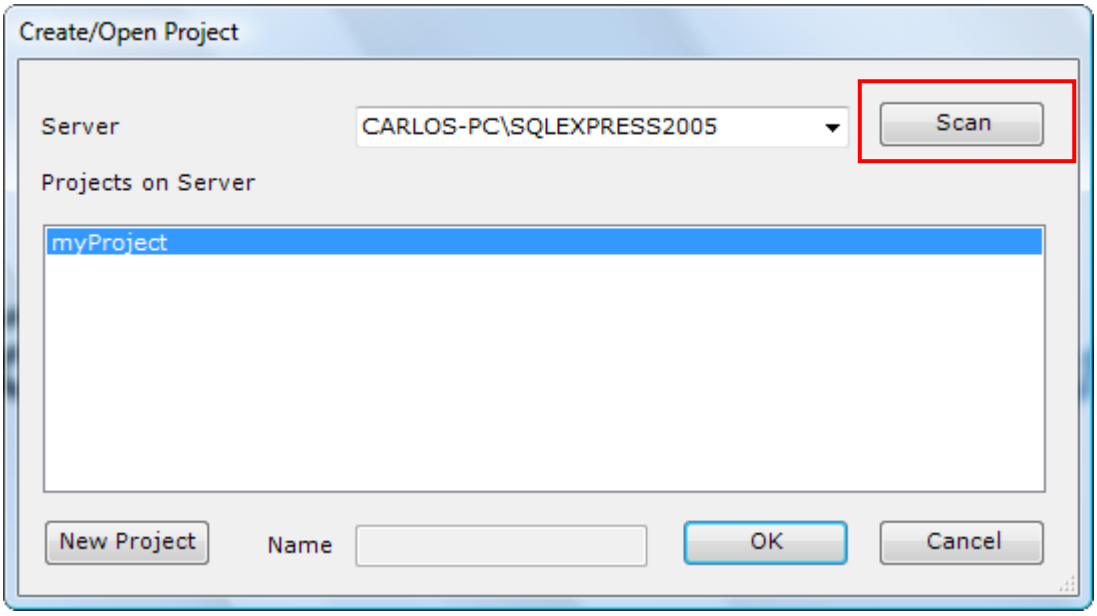
Open the Windows Firewall on the server. Select the tab “Exceptions” (“Ausnahmen” in the picture below):



5. Add exceptions for the programs SQL Server (sqlservr.exe) and SQL Browser (sqlbrowser.exe) by clicking on Program and browsing to the executables. Their normal installation paths are:
   C:\Program Files\Microsoft SQL Server\MSSQL.1\MSSQL\Binn\sqlservr.exe
   C:\Program Files\Microsoft SQL Server\90\Shared\sqlbrowser.exe
6. Click OK

Step 3 - Check configuration

1. Start Aligned Elements on a client which is on the same network as the database installation.
2. In the Create/Open Project Dialog, Scan for databases



3. If all is working, the configured database should be displayed in the Server combo box.

4. Create a new project to test the connection.

Troubleshooting:

5. A message box will be displayed with the names of all servers that were found on the network if the scanning did not succeed. The problem during scanning could be that the databases did not provide their instance name ("SQLEXPRESS2005" in the picture above) which is needed to properly connect.

   Please check the firewall settings above again to fix the problem (or if your network has a different firewall, please contact your network administrator).

6. No databases are found. This could occur when the remote connection is not properly set-up. To check if this is the problem, type the server and instance name manually in the server combo box (e.g. MyServerName\SQLEXPRESS) and press return *(important: Observe that the slash is a backslash, not a front slash!*). Thereafter try to create a new project to test that the server is valid.

   If this works (but the scanning does not), your problem lies in the firewall settings.

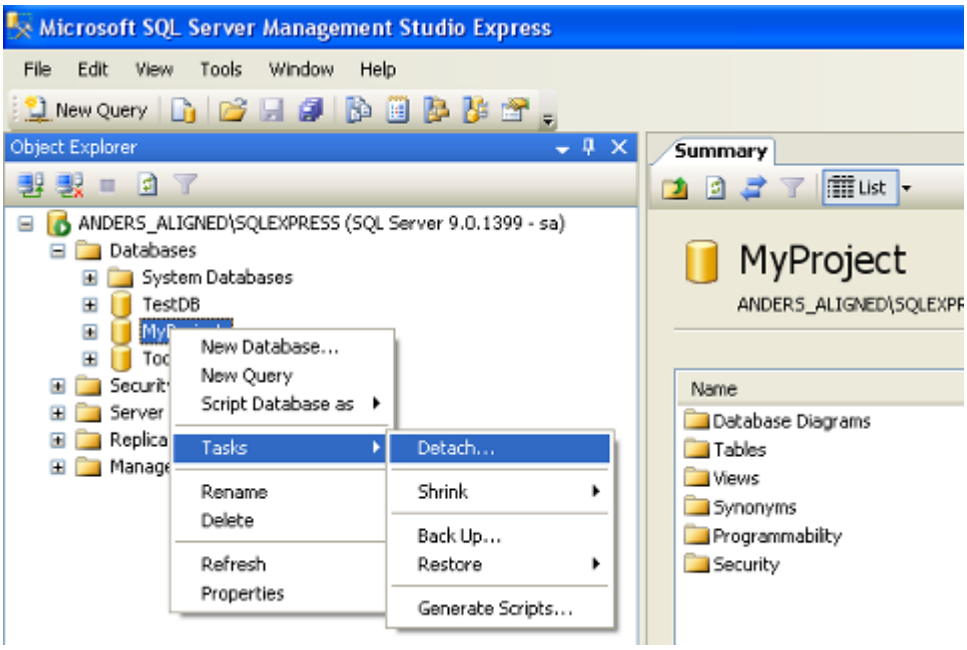
   If it does not work (an error is displayed after creating the project), your problem can be either that the remote access is not configured properly or that the user authentication is not properly set-up (in this case, contact Aligned AG for support).

6.10.2. How to Move a Database/Project to a Different Server

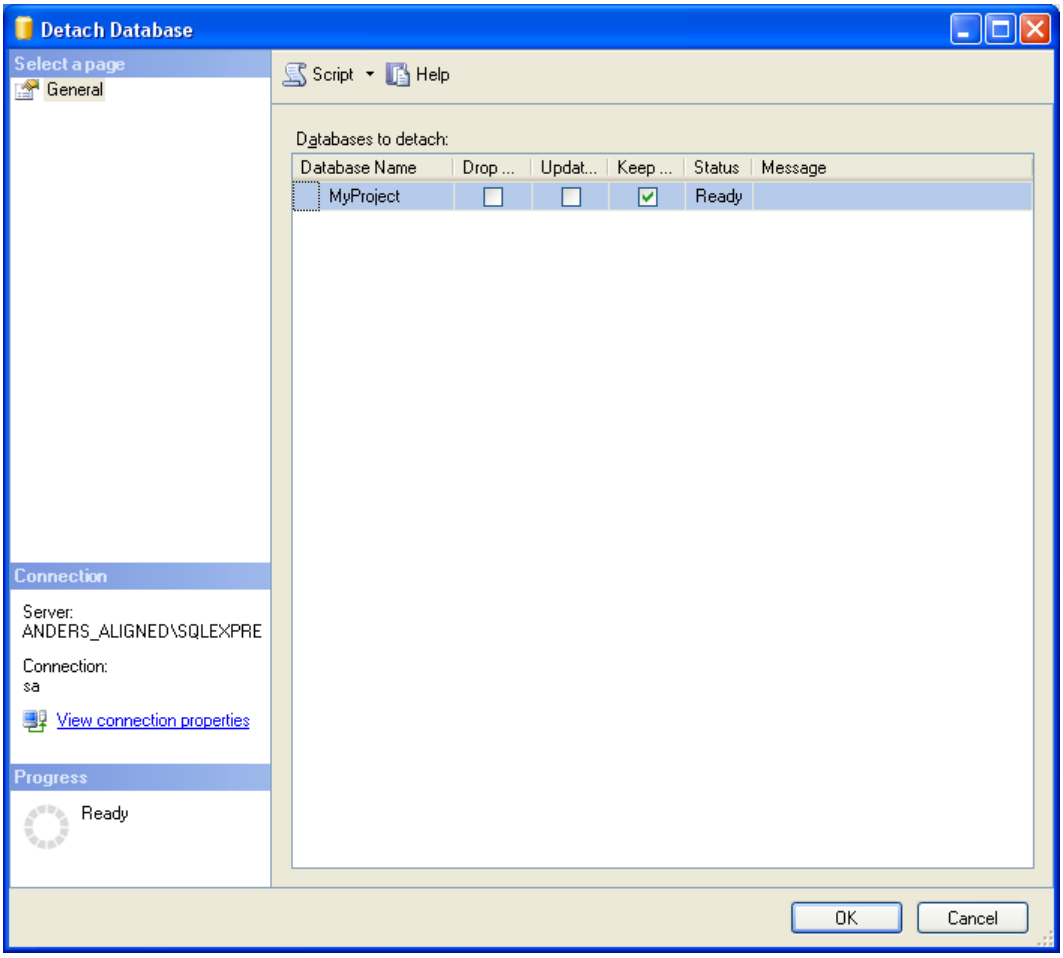
A project consists of one database instance. The database name is always the same as the project name.

To move a database from one server to another you need to have SQL Server 2005 or SQL Server 2005 Express installed on the target server and perform the following steps:

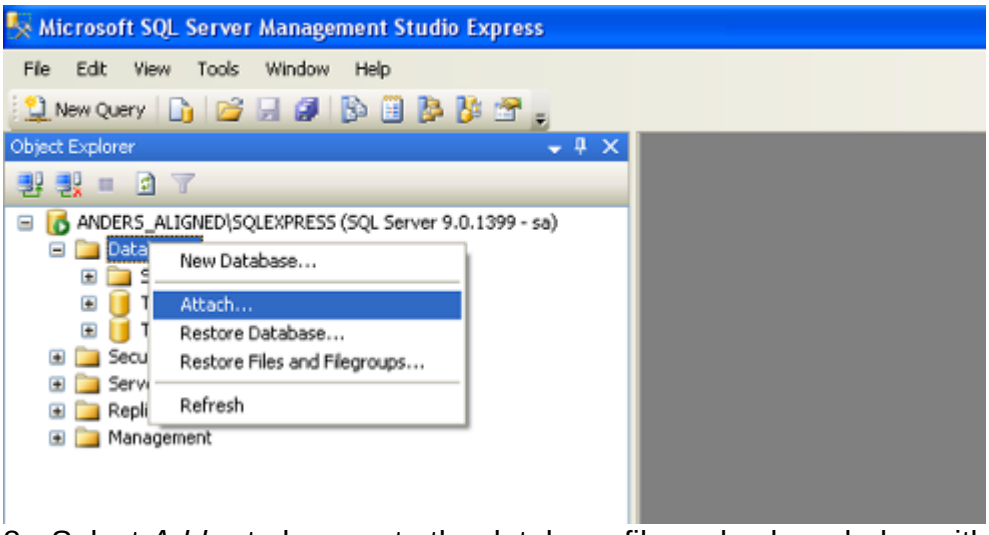
1. Open SQL Server Management Studio (Express) on the original server.
2. Select *Detach…* for the database you want to move.



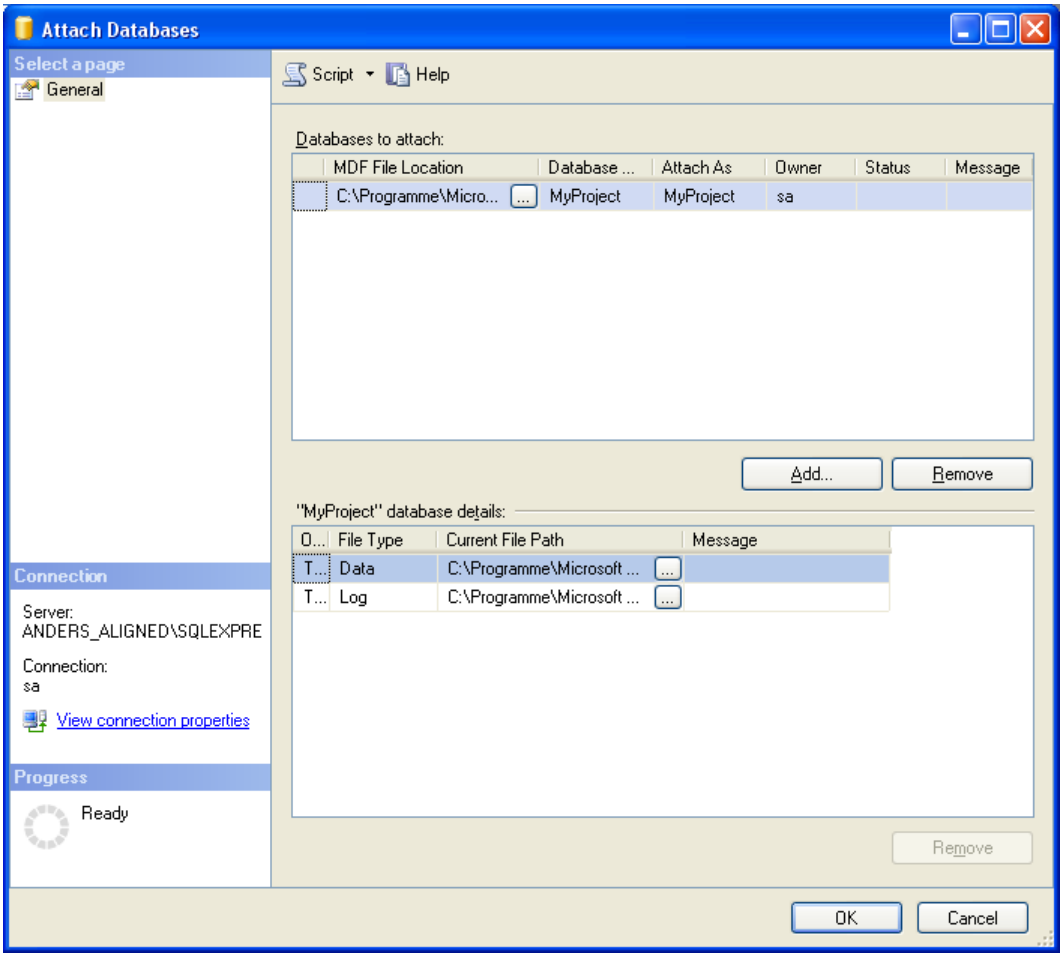
3. You will get a confirmation dialog where you just press OK



4. The data file can be found in:
   C:\Program Files\Microsoft SQL Server\MSSQL.1\MSSQL\Data
   and has the name *yourDbName.mdf.*
5. Copy the data file to the equivalent directory on the target server.
6. Open the Sql Server Management Studio (Express) on the target server.
7. Select *Attach…* to attach the database



8. Select *Add…* to browse to the database file and acknowledge with OK



If the project you have moved is acting as a linked project to other projects, these other projects need to be updated to point to the new server location.

For each project/database that has the moved project as a linked project, run the following query to update the server designation of the moved linked project.

update tblProjectSettings set Server = '<newServerName>' where Name = '<ProjectName>';

9. Start Aligned Elements and open the project from the new server.

6.10.3. How to Backup Your Databases – SQL Server 2005

Please note that most of the following steps require local administrator rights.
The script files:

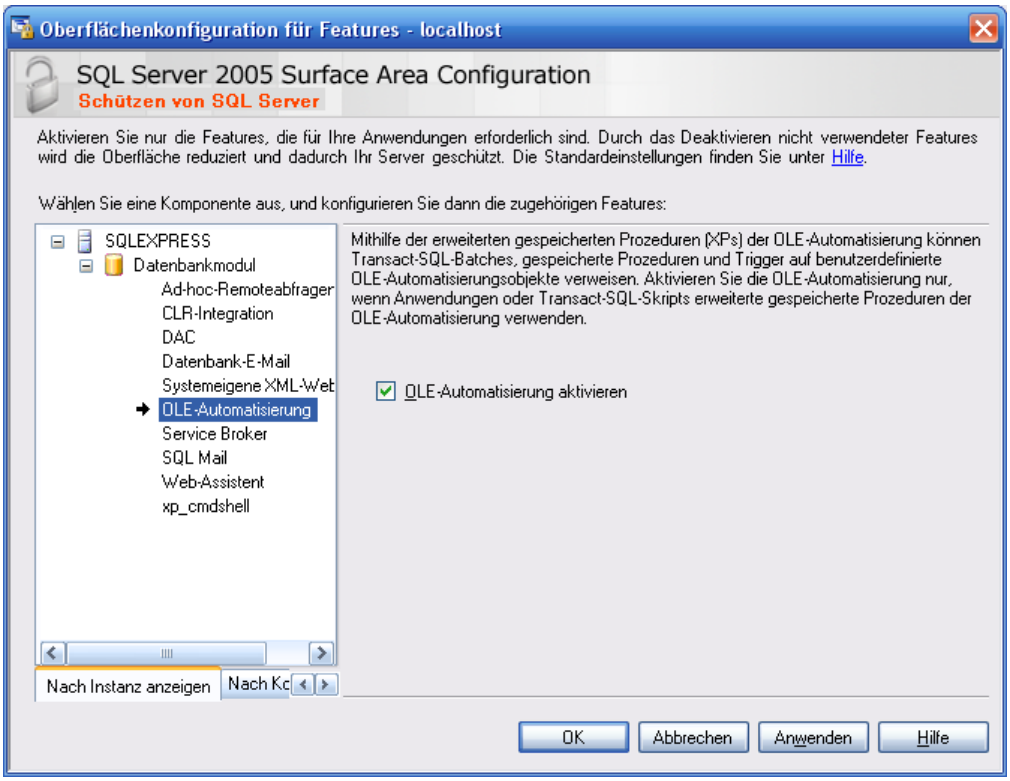
1. backup.sql
2. expressmaint.sql
3. executeBackup.bat

that are mentioned below, can be requested by Aligned AG.

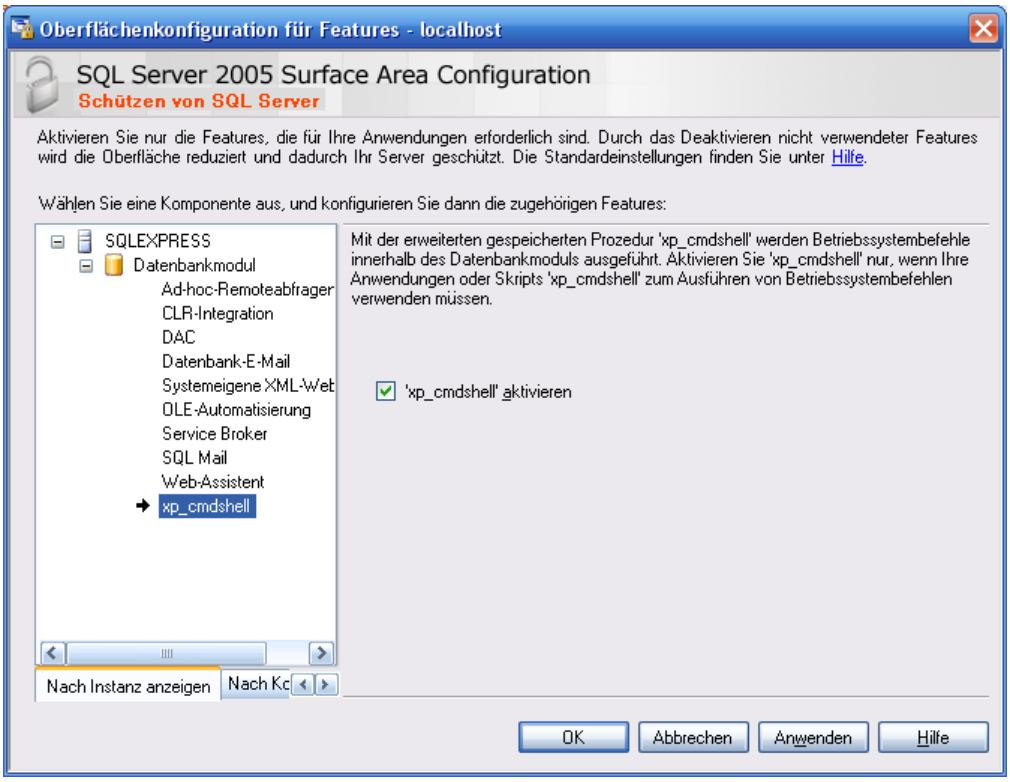
Step 1- Configure your database server

1. Enter the SQL Server Surface Area Configuration.

2. Choose to configure the “Features”.



3. Select the “OLE automation option” and check it. Press “Apply”.



4. Now choose the “xp_cmdshell option” and check it. Press “OK”.

Step 2: Load a stored procedure into the database

Open the Windows Command Prompt, by selecting Start -> Accessories -> Command Prompt.

Execute the following text in the command prompt,

sqlcmd -S .\SQLExpress -i c:\expressmaint.sql

Where

1) “SQLExpress” is the name of your database
2) “c:\expressmaint.sql” is the location i.e. the directory where the expressmaint.sql file is located, which you have received from Aligned.

Step 3: Adapt the backup.sql file

Open the supplied file “backup.sql” in notepad (do NOT use Word, because it will write invisible formatting characters to the file). Now change the file, to suit your needs. The original file looks like this:

```
exec expressmaint
   @database      = 'ALL_USER',
   @optype        = 'DB',
   @backupfldr    = 'c:\backups',
   @reportfldr    = 'c:\reports',
   @verify        = 1,
   @dbretainunit  = 'days',
   @dbretainval   = 1,
   @rptretainunit = 'weeks',
   @rptretainval  = 1,
   @report        = 1
```

‘ALL_USER’ means that all user created databases are backup-ed. If you only want to up backup a single one, just write the name of the database. F.e. @database='MYPROJECTDB'

backupfldr= 'c:\backups' is the directory where the backups will be stored. Change this to suit your need. This could be a directory on a network folder which is backuped onto tape on a regular basis. Make sure that the directory is created before you start. It is not created during the backup procedure.

@reportfldr='c:\reports' is the directory where the backup procedure’s logs are stored. Make sure that the directory is created before you start. It is not created during the backup procedure.

@dbretainunit='days' and @dbretainval= 1 are used to specify how long backups are retained. You can also specify 'weeks'

@rptretainunit = 'weeks' and @rptretainval = 1, are used to specify how long the logs are retained.

After you have changed the file, save it.

Step 4. Schedule a task to perform the backup.

Now open the executeBackup.bat file in Notepad and adapt the path to your backup script “backup.sql”. The line in executeBackup.bat should look like:

sqlcmd -S.\SQLExpress -i"c:\yourdirectory\backup.sql"

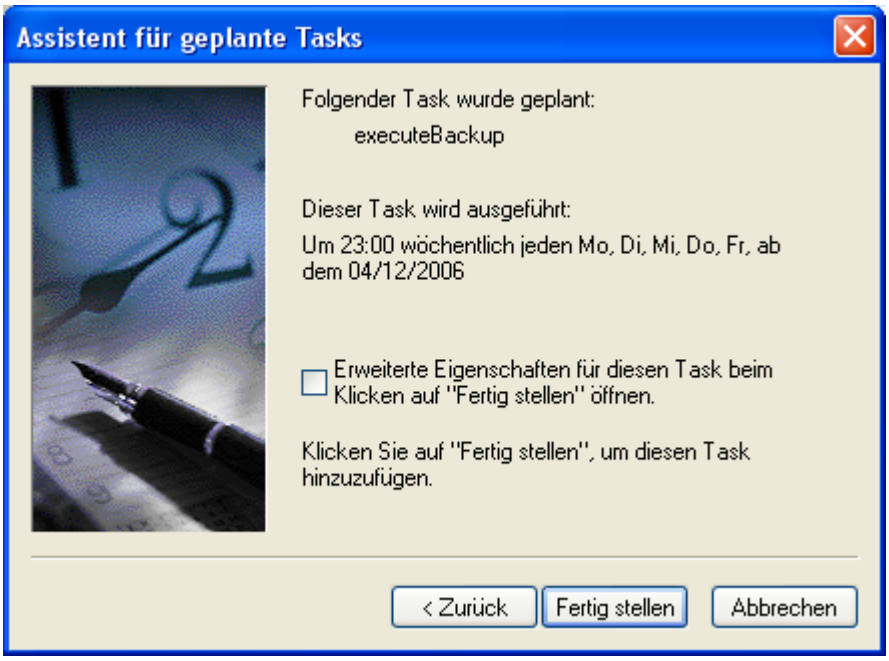
Where
1) “SQLExpress” is the name of your database.
2) “c:\yourdirectory” must of course be replaced with the location where you saved your modified “backup.sql”.

Schedule a task by Adding a scheduled task in the explorer (Control Panel/Add new Task). Browse to the location of executeBackup.bat and configure the desired time and interval:

Picture 1: Set interval

Set time of the day and days in the week

Set the administrator password for this PC



Picture 2: The schedule summary

You can also schedule a teats from the command prompt by starting the command prompt and write (and again, please adapt the path to the location of the “executeBackup.bat” script):

```
C:>at 23:00 dbBackup /every:mo,tu,we,th,fr "c:\yourdirectory\executeBackup.bat"
```

We recommend setting the execution interval to daily. Please choose a time, where not many people will be working with Aligned Elements, because during the backup, the performance will go down.

You can find the reason for any execution errors in the event manager filed under system events (e.g. typically the paths are not fully matching). You can also track the execution status in the special folder Scheduled tasks in the Control Panel.

6.10.4. How to Backup Your Databases – SQL Server 2008

Please note that most of the following steps require local administrator rights.
The script files:

1. backup.sql
2. expressmaintSQL2008.sql
3. executeBackup.bat

mentioned below, can be requested by Aligned AG.

Step 1- Configure your database server

5. Activate OLE Automation by opening the SQL Server Management Studio and perform the following query:

```
sp_configure 'show advanced options', 1;
GO
RECONFIGURE,
GO
sp_configure 'Ole Automation Procedures', 1;
GO
RECONFIGURE;
GO
```

6. Activate the “xp_xmdshell” by opening the SQL Server Management Studio and perform the following query:

```
sp_configure 'show advanced options', 1;
GO
RECONFIGURE;
GO
sp_configure 'xp_cmdshell', 1
GO
RECONFIGURE;
GO
```

Step 2: Load a stored procedure into the database

Open the Windows Command Prompt, by selecting Start -> Accessories -> Command Prompt.

Execute the following text in the command prompt,

sqlcmd -S .\SQLExpress -i c:\expressmaintSQL2008.sql

Where

1) “SQLExpress” is the name of your database
2) “c:\expressmaintSQL2008.sql” is the location i.e. the directory where the expressmaintSQL2008.sql file is located, which you have received from Aligned.

Step 3: Adapt the backup.sql file

Open the supplied file “backup.sql” in notepad (do NOT use Word, because it will write invisible formatting characters to the file). Now change the file, to suit your needs. The original file looks like this:

```
exec expressmaint
  @database      = 'ALL_USER',
  @optype        = 'DB',
  @backupfldr    = 'c:\backups',
  @reportfldr    = 'c:\reports',
  @verify        = 1,
  @dbretainunit  = 'days',
  @dbretainval   = 1,
  @rptretainunit = 'weeks',
  @rptretainval  = 1,
  @report        = 1
```

'ALL_USER' means that all user created databases are backup-ed. If you only want to up backup a single one, just write the name of the database. F.e. @database='MYPROJECTDB'

backupfldr= 'c:\backups' is the directory where the backups will be stored. Change this to suit your need. This could be a directory on a network folder which is backuped onto tape on a regular basis. Make sure that the directory is created before you start. It is not created during the backup procedure.

@reportfldr='c:\reports' is the directory where the backup procedure's logs are stored. Make sure that the directory is created before you start. It is not created during the backup procedure.

@dbretainunit='days' and @dbretainval= 1 are used to specify how long backups are retained. You can also specify 'weeks'

@rptretainunit = 'weeks' and @rptretainval = 1, are used to specify how long the logs are retained.

After you have changed the file, save it.

Step 4. Schedule a task to perform the backup.

Now open the executeBackup.bat file in Notepad and adapt the path to your backup script "backup.sql". The line in executeBackup.bat should look like:

sqlcmd -S.\SQLExpress -i"c:\yourdirectory\backup.sql"

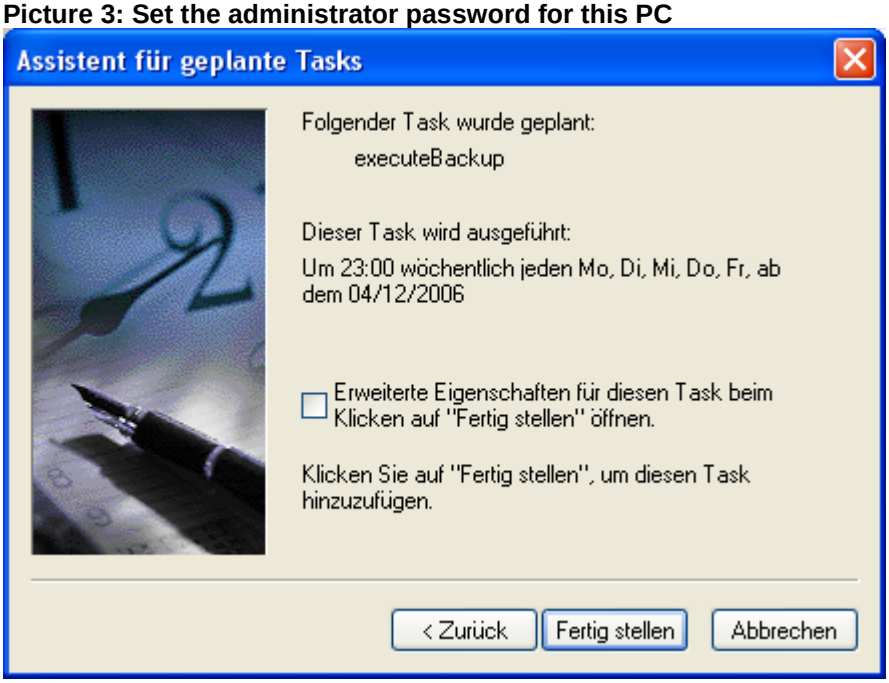
Where
1) "SQLExpress" is the name of your database.
2) "c:\yourdirectory" must of course be replaced with the location where you saved your modified "backup.sql".

Schedule a task by Adding a scheduled task in the explorer (Control Panel/Add new Task). Browse to the location of executeBackup.bat and configure the desired time and interval:

Set interval

Set time of the day and days in the week

Picture 3: Set the administrator password for this PC



Picture 4: The schedule summary

You can also schedule a teats from the command prompt by starting the command prompt and write (and again, please adapt the path to the location of the “executeBackup.bat” script):

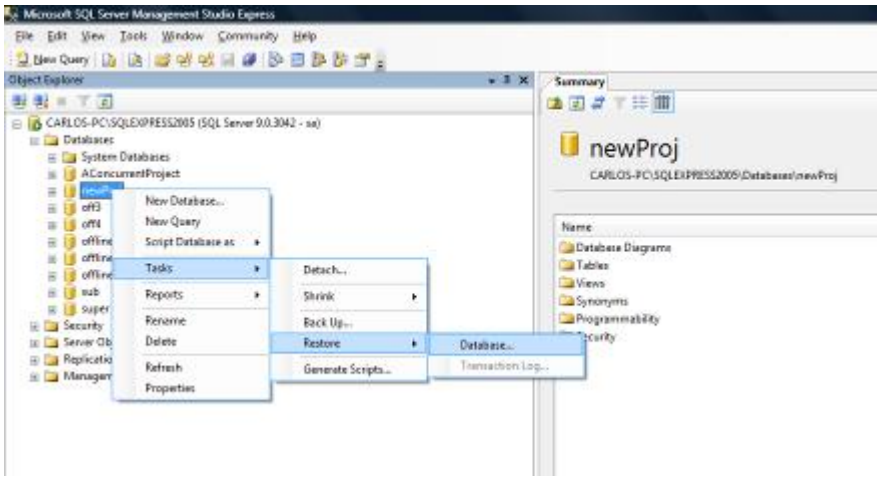
```
C:>at 23:00 dbBackup /every:mo,tu,we,th,fr "c:\yourdirectory\executeBackup.bat"
```

We recommend setting the execution interval to daily. Please choose a time, where not many people will be working with Aligned Elements, because during the backup, the performance will go down.

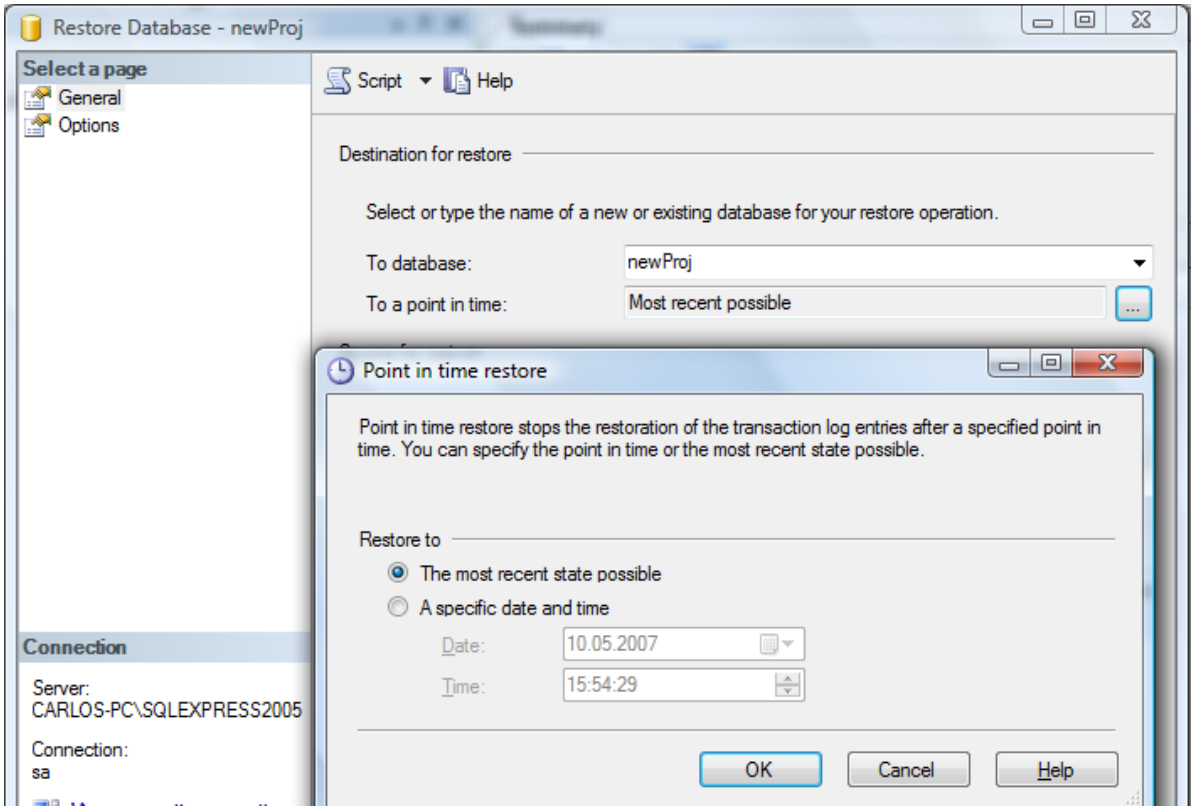
You can find the reason for any execution errors in the event manager filed under system events (e.g. typically the paths are not fully matching). You can also track the execution status in the special folder Scheduled tasks in the Control Panel.

6.10.5. How to Restore your backed up databases

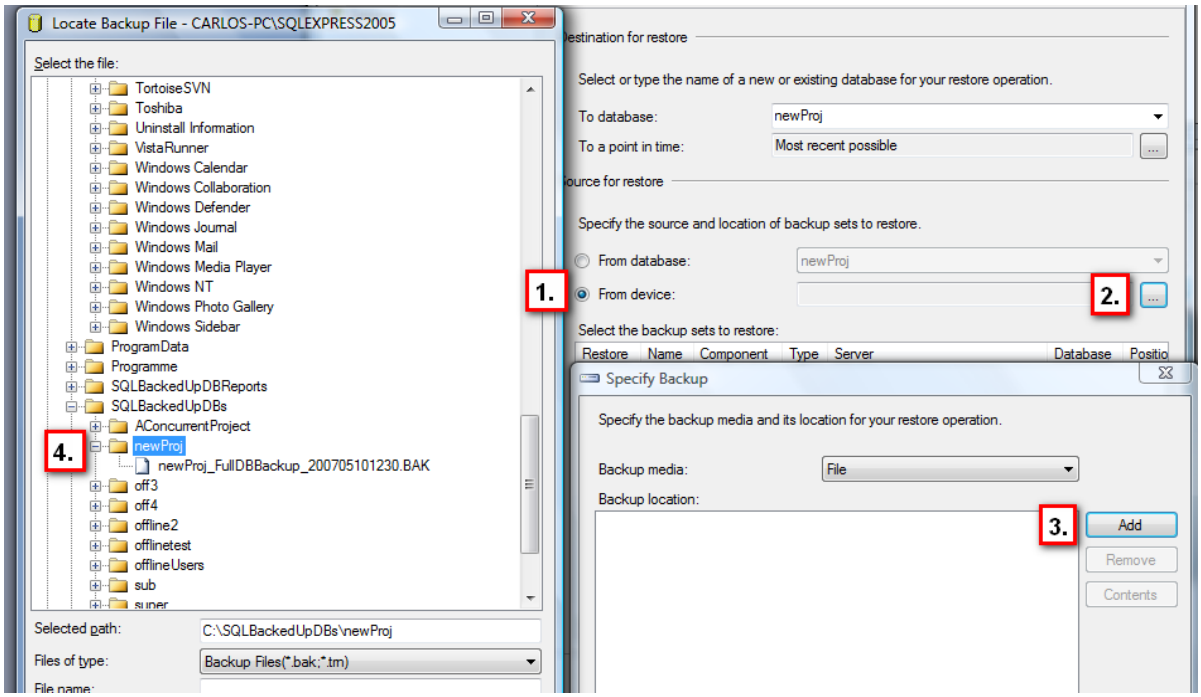
1) Open SQL Server Management Studio (Express) on the original server.
2) Connect to the database server.
3) Expand the Database Folder.
4) Right click on the database you want to restore and select Tasks -> Restore…->Database



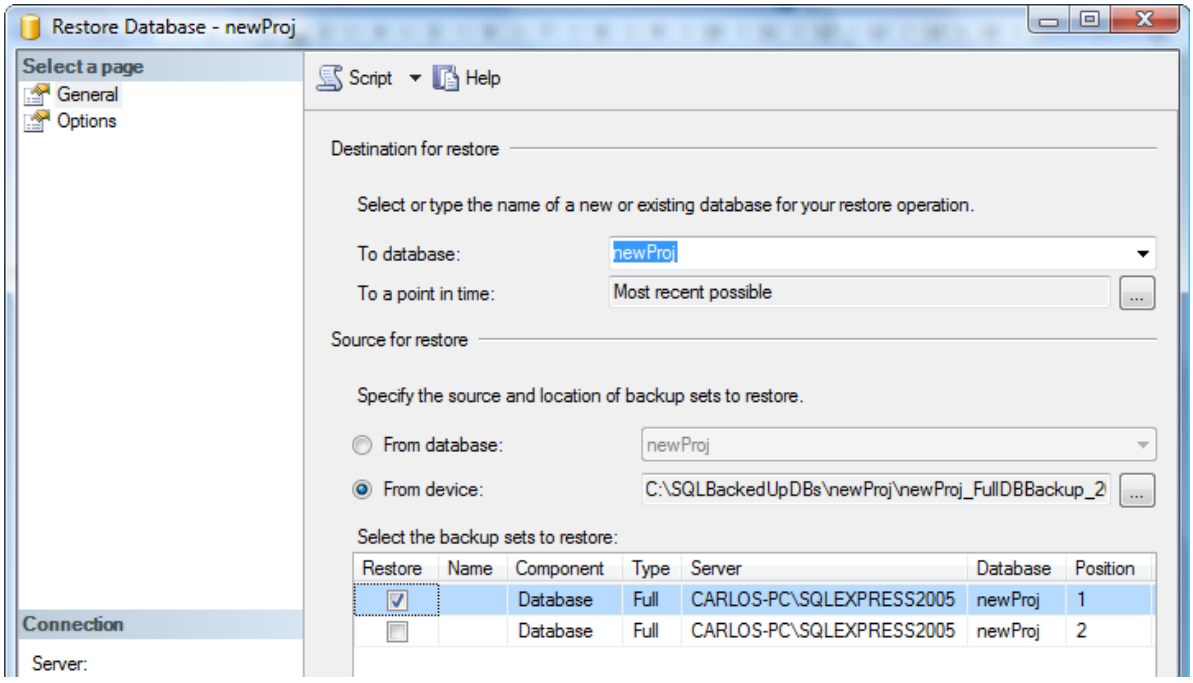
5) Select the back up you want to use by selecting a point in time.



6) Select “From Device” (1) and click the Browse button (2). In the next dialog select “Add” (3) and browse to the directory where you have backed up the database and select the back up file (4).



Tick the check box of the backup file you want to use and click OK to restore the database.



Note! When completed you need to run the following to SQL Queries on your project.

1) *ALTER DATABASE "<the database name>" SET NEW_BROKER WITH ROLLBACK IMMEDIATE;*

2) *ALTER DATABASE "<the database name>" SET ENABLE_BROKER;*

Note the quote around the project name.

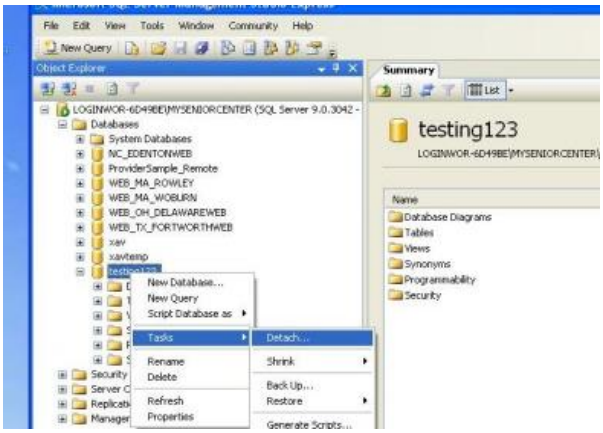
6.10.6. How to copy and rename an SQL Server database

Note! Make sure the collation of the source server and database is the same as the collation of the target server and database. This is especially important for linked projects.

Note! No incoming traces to the renamed project from other projects will be set when renaming a project this way.
These traces have to be set manually again for the renamed project.

1) Take a backup of the database you intend to copy. Make sure that no one uses or will use the database at the moment you perform this operation.

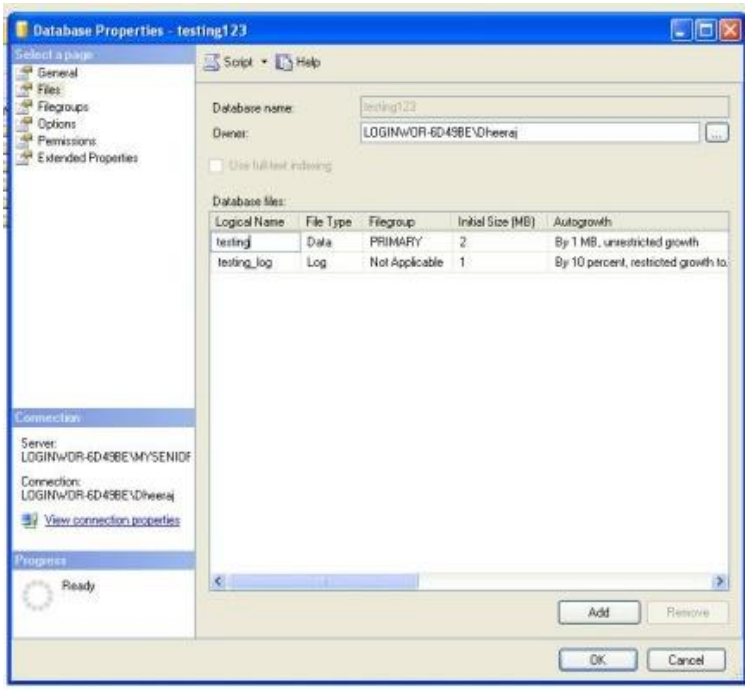
2) Use SQL Server Management Studio to detach the database. Right click on the database, from “Tasks” menu, select “Detach”. If detach cannot be done, select the “Drop all connection” option and try again.



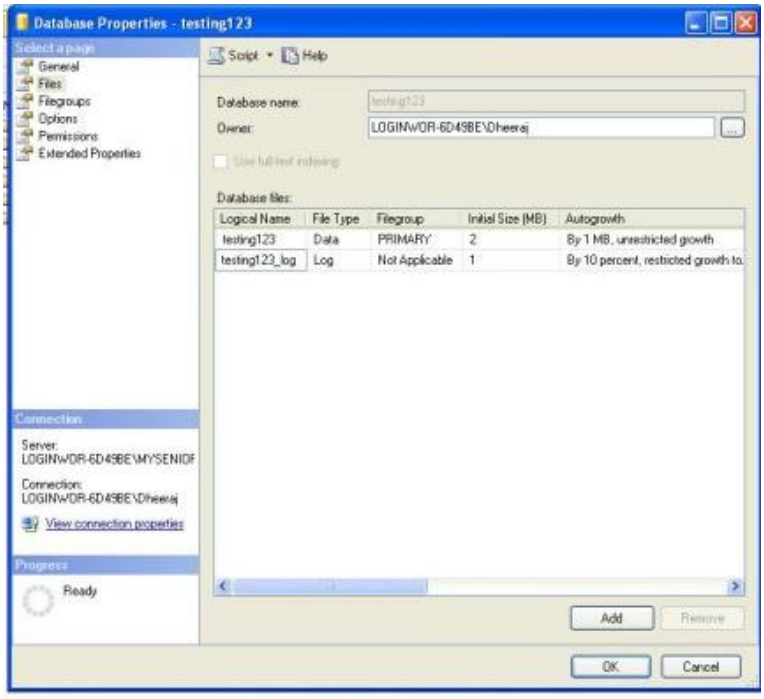
3) Check where the files are stored from the “properties”->”Files” tab. Navigate to that path and take copies of the mdf and ldf file and store the copies in a different location.

4) Attach the database again using the context menu in SQL Server Studio Manager.. (Similar to 1)

5) Rename the logical file names by open the database properties and select the “Files” tab.



Place the cursor in the cell, under the column “Logical names” and type the new name for both MDF and LDF files:



Press “ok” to close this screen. The logical files are now renamed.

5) Detach the database again (see Step 1)

6) Navigate to the physical files (see step 2) and rename the physical .mdf file (using F2 in the File Explorer) and delete the .ldf file.

7) Use the following query to attach the renamed database again. A new ldf file will automatically be created

```
USE master;

GO
CREATE DATABASE <newName>
    ON (FILENAME = '<location of the renamed mfd file')
    FOR ATTACH ;
GO
```

8) When the database has been attached perform the following queries:

- ALTER DATABASE "<the database name>" SET NEW_BROKER WITH ROLLBACK IMMEDIATE;

- ALTER DATABASE "<the database name>" SET ENABLE_BROKER;

Note the quote around the project name.

9) After that has been completed perform the following queries on the attached database:

```
update tblChapter set ProjectName = '<newDBName>' where ProjectName = '<oldDBName>';

update tblRevisableObject set projectName = '<newDBName>' where projectName =
'<oldDBName>';

update tblTrace set projectName = '<newDBName>' where projectName = '<oldDBName>';

update tblSignatureLink set projectName = '<newDBName>' where projectName =
'<oldDBName>';

update tblUserFavourite set ProjectName = '<newDBName>' where ProjectName =
'<oldDBName>';

update tblProjectSettings set Name = '<newDBName>' where Name = '<oldDBName>';

update tblObjectQuery set XmlString = REPLACE(XmlString, '<InputObject>oldDBName',
'<InputObject>newDBName')
Where (XmlString LIKE '%StaticInput%')

update tblObjectQuery set XmlString = REPLACE(XmlString, '<InputChapter>oldDBName',
'<InputChapter>newDBName')
Where (XmlString LIKE '%DynamicInput%')
```

10) Copy the copies from the original database (see step 2) back into the MSSQL/Data directory.

11) Attach the original database again (see step 3)

12) When the database has been attached perform the following queries:

- *ALTER DATABASE "<the database name>" SET NEW_BROKER WITH ROLLBACK IMMEDIATE;*

- *ALTER DATABASE "<the database name>" SET ENABLE_BROKER;*

Note the quote around the project name.